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New Methods of Machine-Gun Fire.[1]

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PART I. KINDS OF FIRE.[2]

GENERAL.

THE machine-gun sheaf is produced when continuous fire is delivered from a machine gun. Its size depends entirely on the shaking of the sled, the vibration and heating of the barrel, and variations in the ammunition. The machine-gun sheaf has, therefore, constant dimensions even under service conditions. The gun pointer is only able to displace the sheaf but not to enlarge it. In this lies the material difference between the machine-gun sheaf and the infantry sheaf. The sheaf of a poorly trained infantry company is even in peace greater than that of a well-trained one. While under the disintegrating influences of battle, the infantry sheaf is materially enlarged, that of the machine gun will even in action deviate little or not at all from its peace dimensions. The so-called loss of nerve control does not appear here to the same extent, because being protected by the cover of the gun and in some cases by the shield, etc., the gun pointer is not subjected to the same extent to the influences of battle. With 100 or 200 m. deep fire, the new method of firing is so coarse that even any loss of nerve control which results in displacement of the sheaf through aiming errors, but as just stated, not in an enlargement of the sheaf, would be neutralized. The commander has it in his hands to adapt the extent of deep fire to service conditions.

[1]Translated for the INFANTRY JOURNAL from *Das neue Maschinen-Gewehr Schiess-Verfahren.*

[2]The classification of machine-gun fire according to the form of the sheaf as given in the original text includes: point fire (*Punktfeuer*), deep fire (*Tiefenfeuer*) and broad fire (*Breitenfeuer*). Although these classes of fire roughly correspond to the terms concentrated fire, zone fire, and traversed fire respectively, they are more comprehensive and are used in certain cases where the more usual English term would not apply. They have therefore been retained throughout this translation.—Editor.

CHAPTER 1. SERIES FIRE.

Series fire is a string of about 50 shots, fired with fixed deflection and elevation levers.

Figure 1 presents a diagram of hits thus fired which was described on a large target at a range of 1,000 meters. The distribu-

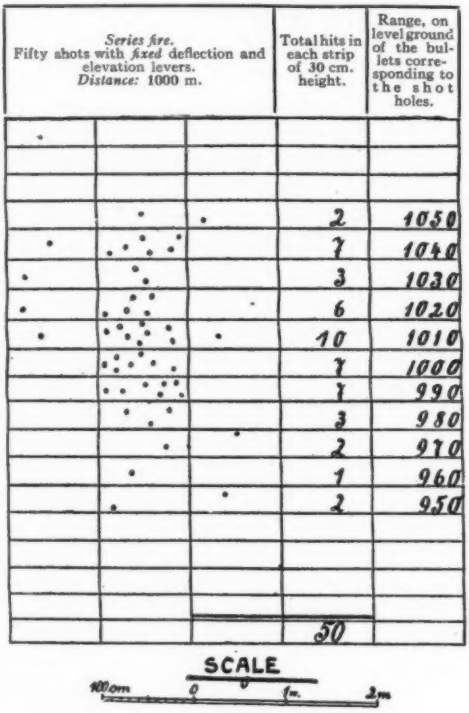


FIGURE 1.

tion of the hits is not the same in every diagram of this kind, but varies with the vibration of the sled, quality of the barrel, etc. As may be seen from Figure 1, in series fire the machine-gun sheaf is very narrow; leaving out of consideration the isolated hits at the extreme right and left, one can speak here, *e. g.*, of a sheaf

1 meter wide at 1,000 meters. The sheaf is not as narrow as this on all targets, and occasionally the width of the sheaf is greater than the height. These are peculiarities which have their origin in the construction of the sled and the way it is set up. It is not practicable to hit a narrow service target with this sheaf on account of the limited facilities for observation under war conditions; the series-fire sheaf can therefore be used only for adjustment fire. Two machine guns with the same range will seldom have the same center of impact; the location of their sheaves will always be somewhat different vertically as well as laterally. If it is desired to adjust the fire by platoon, *i. e.*, to fire with 2 or 3 machine guns at one and the same point from which the two or three sheaves will practically become one, the point of aim must be accurately announced and then accurate lateral adjustments made. The peculiarities of the different guns must be reckoned with, *e. g.*, a gun which shoots to the left must shift its aiming point, in adjustment fire by platoon, more to the right. Differences in the point of impact, which have their cause in the way the sled is set up, can in some measure be counteracted only by specially careful and uniform setting up of the sled on its four feet. In general, in adjustment fire, one must seek to have the sheaves strike at a lateral interval of 5-10 meters at the target to enable the platoon leader, while observing, to bring at least two, or in platoons of three guns, all three sheaves if possible within the field of vision of his glasses. The poorer the conditions for observation, the more accurately must the point of aim be described laterally should it be desired to unite the sheaves of the different machine guns into one.

In firing for adjustment on one point with three or six machine guns, the sheaves will always so overlap that one great sheaf is formed. This sheaf is, however, so deep that it will give only an approximate indication of the range.

The depths of the beaten zone can be found in the table on page 33.

As to the value of these figures, there will be, as always and everywhere, very different views, but I desire to point out that for practical shooting, approximate knowledge of these figures, or better still, a consultation of these tables, may save an officer from a false judgment. Who, for example, has not observed in adjustment fire one or the other sheaf extraordinarily deep? And

THE MACHINE-GUN SHEAF IN SERIES FIRE.

Distance	100 per cent		Distance	100 per cent	
	Vertical diameter	Depth of beaten zone		Vertical diameter	Depth of beaten zone
500 m	1.2 m	185 m	1100 m	3.5 m	90 m
600 m	1.5 m	160 m	1200 m	4.1 m	85 m
700 m	1.8 m	140 m	1300 m	4.8 m	78 m
800 m	2.1 m	125 m	1400 m	5.6 m	75 m
900 m	2.6 m	110 m	1500 m	6.6 m	73 m
1000 m	3.0 m	98 m	1600 m	7.7 m	72 m

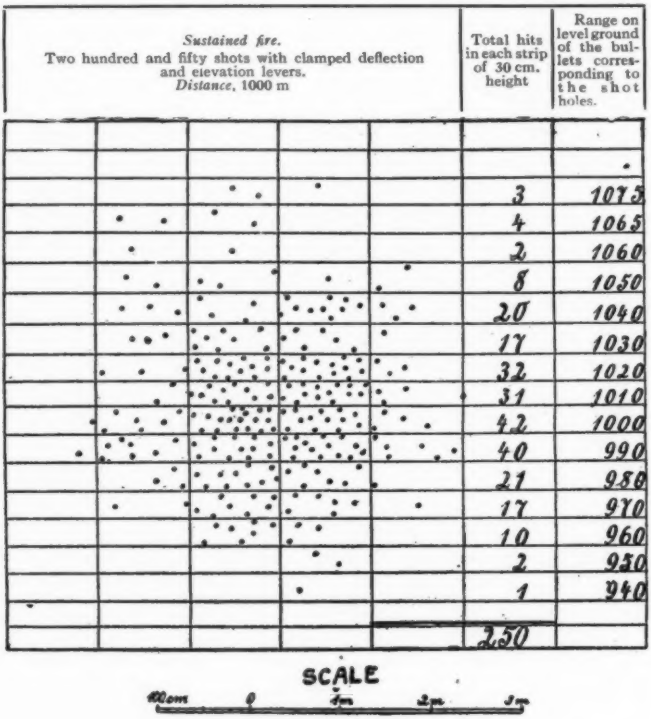


FIGURE 2.

who has not accused the gun pointer of having an unsteady hold? Did such officer know that through "a steady hold," the sheaf will often, even usually, be enlarged rather than diminished? And that the gun pointer was thereby caused to commit serious errors, namely, to displace the entire sheaf by pressing down or lifting up the handle, and that just through this the object sought in series firing was defeated, namely, to observe where the sheaf strikes, when the point of aim is just below the target, and with natural vibration of the sled and the gun!

In series fire, the handle must be lightly held, and the gun pointer should not disturb the natural vibrations of the gun; in this manner, the best results will be obtained, *i. e.*, the smallest grouping of the hits. A firm hold is absolutely without purpose, because the machine gun is fixed as to elevation and deflection; it is different in firing for effect when the gun pointer must aim and correct during sustained fire and where in addition the gun may jump out of his hand.

CHAPTER 2. POINT FIRE (*Punktfeuer*).

Point fire is sustained fire with loose deflection and elevation levers, in which the gun pointer holds the line of sight to the best of his ability on the designated aiming point. Before the war, point fire was used only against narrow targets, as machine guns, cannons, etc., and again when the gun commander desired to test the location of his machine-gun sheaf.

This use of point fire justified itself fully in the war, but it was also often used in firing for effect. More will be said of this at the end of this chapter.

Unfortunately, the very close sheaf of series fire cannot be employed for attacking narrow targets as it is too narrow, for even when delivering 250 shots sustained fire with fixed deflection and elevation levers the sheaf is still too narrow. In Figure 2 compared with Figure 1, the sheaf is indeed enlarged, but this width is still insufficient for firing against narrow targets at battle ranges and with unfavorable conditions of observation; no one would fire 250 shots in succession without making any correction based on the effect observed. If the same diagram is fired as before with fixed deflection lever but loose elevation lever, the diagram is not changed at all laterally and very little vertically. The deflection lever must, therefore, necessarily be loosened. Figure 3

Point fire.

Two hundred and fifty shots with loose deflection and elevation levers.
No deep fire. Distance: 1000 meters. Sight setting: 1000 meters.

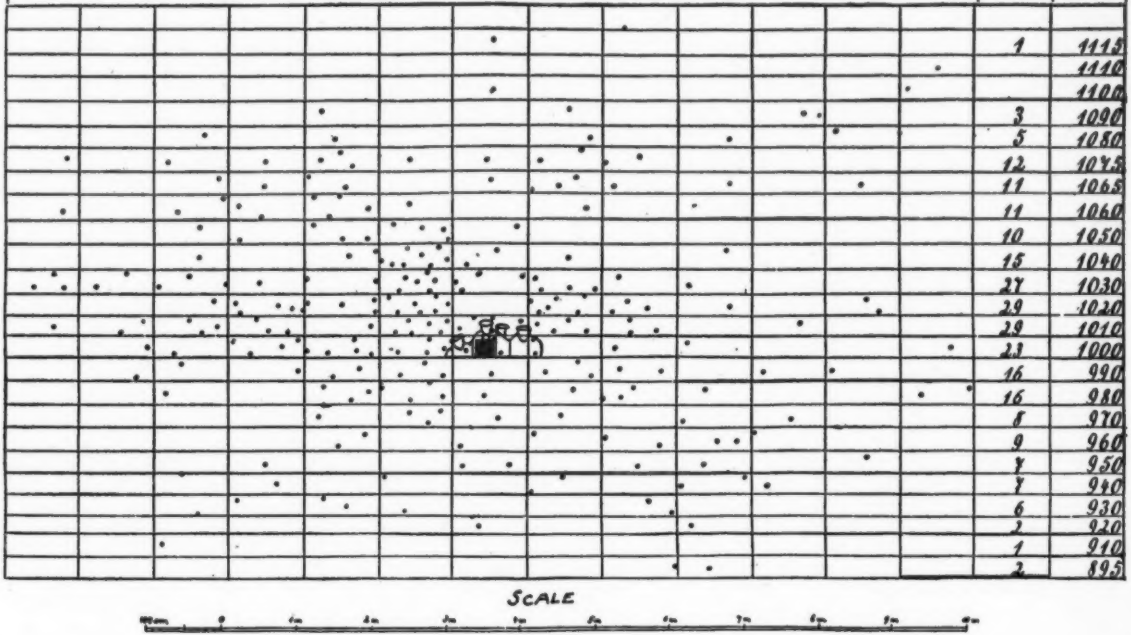


FIGURE 3.

shows a diagram fired with 250 shots under service conditions, and with loose deflection and elevation levers. With poorly trained gun pointers or slightly visible targets, the sheaf is considerably widened. This sheaf can be narrowed only by having the armorer sergeant fit the clamping piece very tightly, or by winding a little asbestos string around the upper trunnion of the jacket before screwing on the upper part of the jacket carrier, so that a lateral movement of the machine gun on the cradle will be impossible. This is, however, an obstacle in broad (traversed) fire, and one must, therefore, be satisfied with a middle course. The sheaf may also be narrowed with clearly visible aiming point and when weather conditions most completely prevent the appearance of powder smoke. Should more smoke or even steam leaking through between barrel and stuffing box appear,[3] unavoidable stops must be made for resighting. A series fire is the result.

FIGURE 3.

Figure 3 is fired without any deep fire with 250 shots, and the machine-gun target is inserted correct to scale. From this it will be seen that at 1000 meters even with very good location of the sheaf, one cannot always count on a particularly high result. Five or six hits out of 250 shots, with best location of the sheaf and without deep fire, may be regarded as a good result; to prove this, the target may be placed in any desired position in the sheaf.

In using deep fire, the sheaf becomes thinner, the resulting hits therefore still fewer. To obtain an equally large number of hits, the amount of ammunition must be materially increased. From this it follows that no blame can be attached to the gun commander or gun pointer should his machine gun using deep fire make only 1 or 2 hits out of 250 shots, especially when at the time of firing the observation was not good. Broad fire against narrow targets, which is an intentional broadening of the already really broad sheaf of point fire, is only justified in very exceptional cases, with total lack of observation, abnormal weather conditions (very strong cross wind), against columns at long range, etc. The result in hits will in consequence be smaller.

Point Fire as Fire for Effect.

In war, long lines of skirmishers do not always offer themselves as targets, but often only single heads are visible which

[3] A sign that the asbestos packing is too weak or insufficiently greased.

do not justify a long sustained fire. Nevertheless, these single visible heads must be fought down with machine guns. The machine gun will, to a certain degree, be on the lookout with telescopes, and as soon as a head appears, 5, 10, or even 30 shots point fire must cover the spot so thoroughly that no enemy will venture again to show his head above his cover. These single heads are mostly officers or orderlies and are therefore desirable targets. Point fire is to be used in fire for effect not only against single heads, but also against long lines of skirmishers which are not very visible. All points where an enemy appears will be successively covered with point fire; one point fire after another will be placed alongside each other after short pauses, so that finally a sort of broad fire results. Should the targets be more visible, this series of point fire will become true broad fire. Deep fire will here also almost always be used. For details see later chapters.

CHAPTER 3. BROAD FIRE.

(*a*) *Traversed Once Over the Target Without Deep Fire.*

Broad fire is delivered with loose deflection and elevation levers. It is used in fighting against wide targets.

When changing to fire for effect, it is every gun commander's duty to again adjust his fire and to try again to secure observation in his sector so as to have to use as little deep fire as possible in the ensuing fire for effect. If in this repeated adjustment fire the gun commander attains his object—the sheaf lay exactly on the target—he changes to broad fire. One should suppose in this broad fire the sheaf would now remain in the target, provided that the target is of constant height. Incontrovertible tests have, however, demonstrated that in broad fire, the machine-gun sheaf is subject to variations which are due to the fact that the four legs of the sled are unevenly weighted on account of the lateral displacement of the axis of the gun. Figures 4, 5, and 6 show diagrams of hits, fired at battle ranges with broad fire, in which the elevation aiming apparatus was eliminated. The target was simply covered with broad fire once. In each diagram, sight was taken at a point just below the target at the beginning as well as at the other end. The diagrams show the variations of the sheaf plainly. An idea of the extent of the variations may be readily formed when it is known that each

horizontal strip is 30 centimeters high, and the ranges are read off from the column on the extreme right. The distances show where the hits on the target strike level ground. One can easily understand that these variations, as shown in the diagrams, are not the same in all firings. These are characteristic diagrams selected as examples from a great number of firings. They will explain to most machine-gun officers what they have often themselves observed in range firing without knowing the cause of these variations; it will make it clear to them that the gun commander and gun pointer are often undeservedly accused of having fired badly. The conclusion in such cases that the gun pointer depressed or raised the handle is in most cases erroneous; the gun pointer cannot be held responsible for such variations of the sheaf at the target.

As we now know the cause of the variations of the sheaf at the target, we are in a position to conteract these defects of the weapon. These variations are easily detected when firing under excellent observation, and gun commander and gun pointer must bc so trained in this respect that they can instantly correct the sheaf and hold it on the target. It is exactly this kind of firing that occurs so often in peace, and it forms an excellent school for the training of efficient gun commanders and gun pointers.

Similar cases also occur under service conditions.

With less favorable observation, it often happens that these variations of the sheaf cannot be detected quickly enough, and the sheaf will often be displaced from the target without being observed by the gun pointer. In such cases, the use of deep fire with broad fire is recommended. Of this, more will be said later.

By closely scrutinizing Figures 4, 5, and 6, a good idea of the machine-gun sheaf in broad fire may be formed; the sheaf is at many points as narrow as a thin band but unfortunately entirely irregular. While the narrow places of the fire-swept zone are often not over 10 or 15 meters deep, the broad parts of the sheaf have often a depth of from 50 to 100 meters.

Firing with a narrow band seems often very attractive, but the position of the sheaf is too variable; such firing cannot, therefore, be considered practicable under service conditions as a habitual procedure. This firing with a narrow band not only

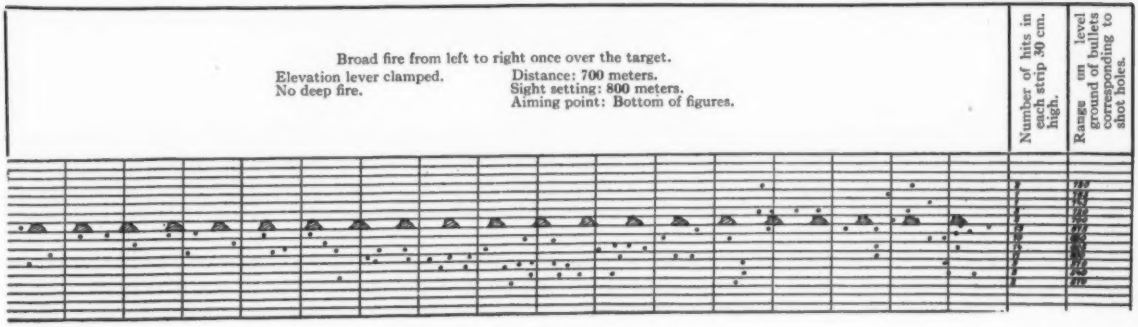

Broad fire from left to right once over the target.
Elevation lever clamped.
No deep fire.
Distance: 700 meters.
Sight setting: 800 meters.
Aiming point: Bottom of figures.
Number of hits in each strip 30 cm. high.
Range on level ground of bullets corresponding to shot holes.

FIGURE 4.

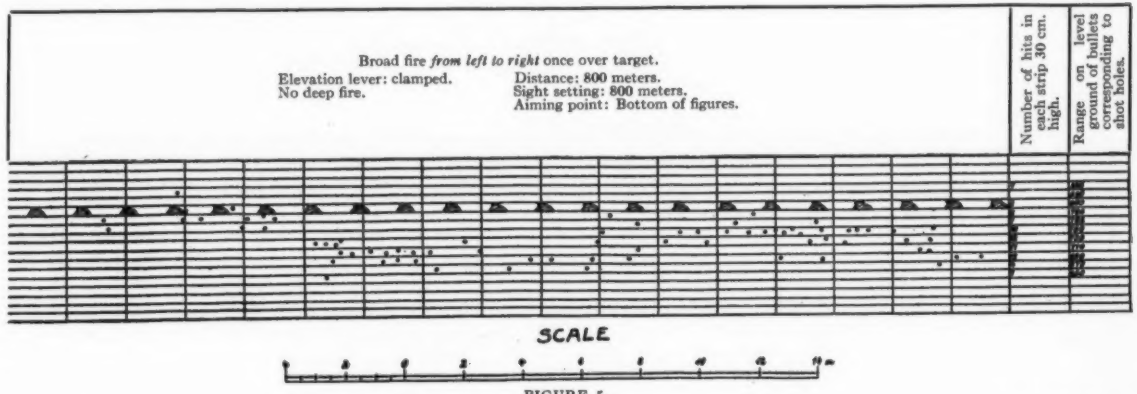

Broad fire *from left to right* once over target.
Elevation lever: clamped.
No deep fire.
Distance: 800 meters.
Sight setting: 800 meters.
Aiming point: Bottom of figures.
Number of hits in each strip 30 cm. high.
Range on level ground of bullets corresponding to shot holes.
SCALE

FIGURE 5.

FIGURE 5.

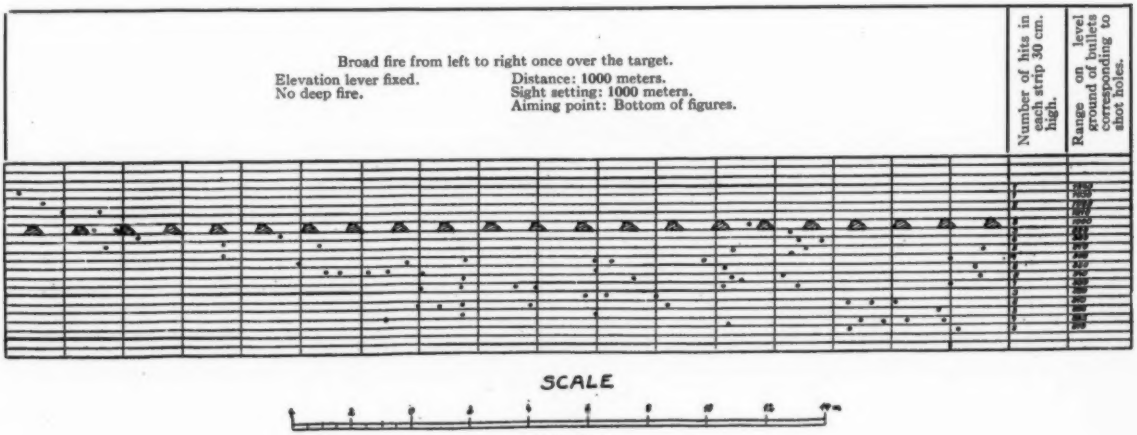

Broad fire from left to right once over the target.
Elevation lever fixed.
No deep fire.
Distance: 1000 meters.
Sight setting: 1000 meters.
Aiming point: Bottom of figures.
Number of hits in each strip 30 cm. high.
Range on level ground of bullets corresponding to shot holes.
SCALE

FIGURE 6.

requires excellent conditions for observation at the target, but also a location of the target on a rising slope, so that one can observe whether the sheaf falls in front of the target or in rear.

The conditions for observation in time of war are identical with those in peace: observation is often excellent, often there is none at all. While before the war, I was of the opinion that the machine-gun sheaf would often disappear in the volume of the infantry sheaf and of striking shrapnel so that it could not be observed, this was not substantiated in the war. The machine-gun sheaves could generally be recognized even in the most intense firing of our own troops. In battle, the difficulty of observation lies not so much in the visibility of the striking projectiles as in the invisibility of the targets. This often forces the machine gun to use extensive deep fire, despite favorable conditions for observation.

The enemy is never in such a position as our targets in peace have up to the present been located; instead, he lies *behind* the rising ground and shows only so much of his head as is absolutely necessary for firing. But firing with the narrow band becomes nearly impossible without observation of the ground in rear of the target.

I would advise all machine gun officers to endeavor to have targets set up under service conditions; although for the training of gun pointers, targets on a rising slope are very instructive.

Exhaustive practice must be had in firing against sections of the terrain—edges of forests, cuts, ridges, etc. Commanders must be trained to detect where the target lies; a solitary head gives often the only indication as to its position. Commanders must know how to direct their machine-gun fire against these sections of the terrain, even under the most severe hostile fire. More detailed information is given at the end of Chapter 6 on "Tables of Fire Effect."

(*b*) *Sustained Fire traversed laterally back and forth without deep fire.*

We have seen in the foregoing chapter that the sheaf in broad fire is very irregular. If the fire is swept continuously back and forth over the target without deep fire, the irregularities will gradually adjust themselves, and uniformly dense

sheaves will result. These sheaves, as shown, *e. g.*, in Figure 7, could be used satisfactorily against lines of skirmishers had they not several faults; namely: The gun pointer cannot change his point of aim, even when the sheaf falls in front or in rear of target. Any change in the point of aim causes a considerable enlargement of the sheaf. As may be seen in the tables in Chapter 5,[1] this sheaf is very deep in its total extent; nevertheless, the useful part of this sheaf is so small that a very small error will throw it off of the target. Examine, *e. g.*, the sheaf at 1000 meters. The useful part is only 70 meters deep. Should the target lie well in the useful part, a variation of the sheaf of only 35 meters would suffice to throw it off of the target. For this reason the target could not lie in echelon as a difference in range of only 35 meters would be sufficient to remove it from the useful part.

In spite of all this, some prefer to fire with the last described sheaf, even without observation, as in many cases very high results are thus obtained, needless to say, with one uniformly distant target.

This is unquestionably true, but the effect is then left to chance, and it is certainly wrong for our machine-gun troops to be able to hit the target only by chance. Machine guns must be able to make hits—known hits at that—under service conditions even without any kind of observation. This was, until now, only possible when firing with several ranges and using deep fire. The deep fire used for this purpose was unsystematic, as the amount of turning the handwheel was not uniform.

(*c*) *Firing with several sights without deep fire according to the old firing methods.*

As will be demonstrated in a later chapter, we can not depend, in firing without observation, on the accuracy of the range finder to such an extent as to use only one sight setting. Cases often arise where it becomes necessary to use 2 or 3 sight settings with 100 meters difference in elevation, or 3 or 5 sights, with 50 meters difference. With ranges of 1000, 1100, and 1200 meters for example, we obtain Figure 7, which was fired by the gun-proving board. The amount of the ammunition used is very great, the sheaves are very large and dense;

[1]To be published in September-October number of the INFANTRY JOURNAL.—Editor.

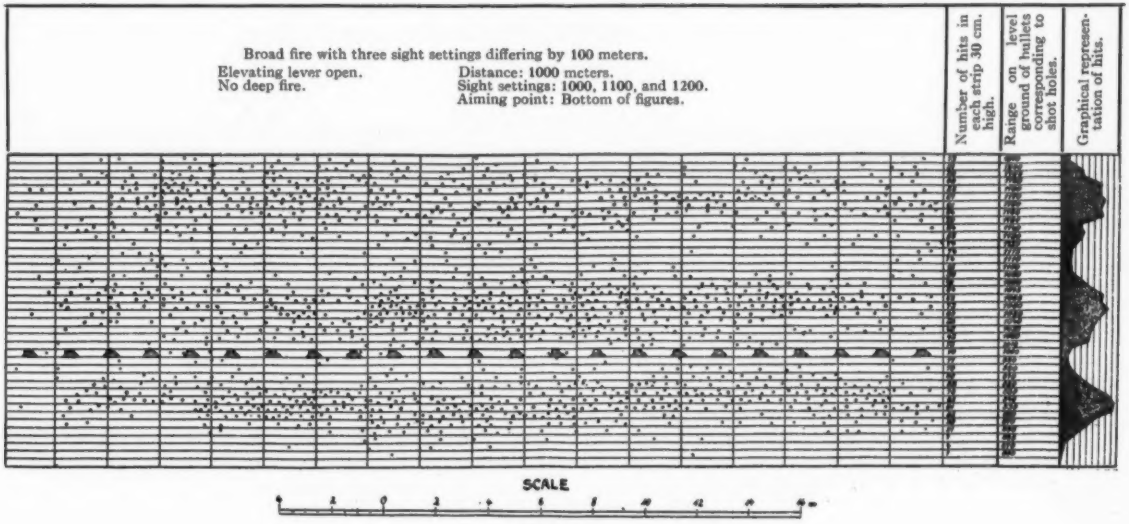

Broad fire with three sight settings differing by 100 meters.
Elevating lever open.
No deep fire.
Distance: 1000 meters.
Sight settings: 1000, 1100, and 1200.
Aiming point: Bottom of figures.
Number of hits in each strip 30 cm. high.
Range on level ground of bullets corresponding to shot holes.
Graphical representation of hits.
SCALE

FIGURE 7.

in spite of this, the defect of the old method is at once apparent in the well defined high and low areas of hits. Where the target lies in a high area, it is full of hits, if in a low area the result to be expected is zero. It must also be considered that this diagram was fired with only one gun. With 2 or 3 guns, the sheaves would have an entirely different position, as only in rare instances will several machine guns have the same center of impact. Should the gun using a range of 1100 be a "short shooting" gun, the sheaves 1000 and 1100 would coincide, and between 1100 and 1200 a still greater low area of hits than that obtained would result. There would be still less assurance of success.

A systematic distribution of hits could be obtained with machine guns having the same center of impact[4] at all distances, and several sight settings, 50 meters apart, were taken. Regardless of the center of impact, which is never exactly the same, the difficulty of selecting the ranges is added. How should, *e.g.*, three ranges be fired by a section of two guns? Or five ranges by a company at a very wide target, head figures at 1000 meters and the width of the target 300 meters? To all the before mentioned difficulties must be added those of fire direction, since as many machine guns as there are sight-settings to be employed must be concentrated on one sector of the target. Should observation become possible at any point during the firing, a change in sight setting is nearly impossible, as it is not known to which range the observed hits pertain.

By using several sight-settings and the old unsystematic deep fire, an approximately uniform distribution of hits on the target would probably be possible, but the extent of the deep fire would continue to be irregular, the difficulties of range selection would be the same, advantage could not be taken of observation, and low areas of hits could, moreover, result from different centers of impact.

CHAPTER 4. DEEP FIRE.

(*a*) *Deep Fire with graduated scale.*

To avoid the faults and difficulties of the former method, one elevation only was used (here 1,200), instead of several eleva-

[4]The center of impact is dependent not only on the machine gun, but in great measure on the setting up of the sled. A machine gun which gives a good center of impact, may give an entirely different one if moved 2 meters to right or left.

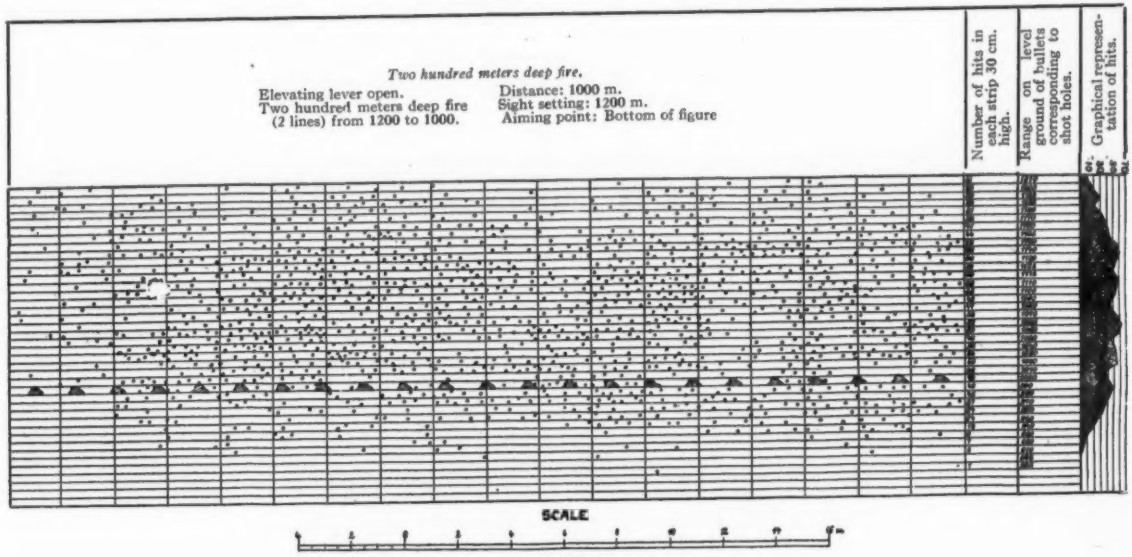

Two hundred meters deep fire.
Elevating lever open.
Two hundred meters deep fire (2 lines) from 1200 to 1000.
Distance: 1000 m.
Sight setting: 1200 m.
Aiming point: Bottom of figure
Number of hits in each strip 30 cm. high.
Range on level ground of bullets corresponding to shot holes.
Graphical representation of hits.
SCALE

FIGURE 8.

tions as in the last mentioned example, and the handwheel during sustained fire was turned through an arc equivalent to the difference between the sight settings of 1200 and 1000. The result of this firing is shown in Figure 8. The dimension of the sheaf in depth is the same as in Figure 7, the upper and lower borders are equally uniform, but in contrast with Figure 7, the distribution of the hits over the entire surface of the target is absolutely uniform. The figures on the right of the illustration show the total of hits in each of the 30 cm.-high strips. Neither high nor low areas of hits appear. A target will be equally well hit at all distances of the useful part of the sheaf. To obtain such a result, the handwheel must be turned uniformly, and the required turn must be made sufficiently but not too far. The following error may easily be made: the gun pointer turns by jerks, *i. e.*, he pauses above and below and moves the line of sight quickly over the center part. The result is many hits above and below, and a well defined low area in the center. The turning should also not be too slow, as with a small ammunition supply, the distribution of hits would not be sufficiently uniform.

To give the gun pointer an approximate idea of how far to turn the handwheel at the different ranges in order to displace the sheaves 100 meters on the target, the graduated scale was constructed.

The lines on the scale show the gun pointer how far the handwheel must be turned. The graduation lines correspond each to 100 meters deep fire. At the longer ranges, the lines are longer, since with increasing range the graduations on the sight leaf are also further apart, thus necessitating greater turning of the handwheel.

Example: Range about 1000 m.

The machine gun is sighted with half sight at a target at 950 m. Changing the sight then to 1050, the line of sight is below the target; now turn the handwheel sufficiently to again bring the line of sight on the target, using half sight. The space covered by the handwheel is equal to the line marked with the number 1000 on the graduated scale.

To deliver 200 or 300 m. deep fire, the handwheel must be turned 2 or 3 times the amount indicated by the graduation.

(*b*) *Instruction in use of Deep Fire.*

It appears at first difficult to keep to the limits indicated on the graduated scale so that the sections of the terrain under fire are really covered as intended. If one takes the trouble to determine the length of a line, it will be found that in every measurement a somewhat different result will be obtained. The cause therefor may be found in insignificant errors in aiming (full sight, half sight, etc.), and in faulty service of the gun at the point of lost motion of the elevating device, which is always in some measure present.

The lost motion has no effect if the machine gun has some overweight at the rear end. This can best be effected, even with a clamping jacket carrier, if the gun pointer exerts a slight downward pressure with the hand on the handle. Should the gun pointer press up on the handle with his hand, the lost motion must first be taken up before the wheel of the elevating mechanism will again respond.

The hand on the handle must be raised by the elevating mechanism; this will not result in an appreciable over-burdening of the hand on the wheel.

The lines on the graduated scale represent average values. It is, therefore, not necessary to hold accurately to the length of the lines. Should, *e. g.*, it be desired with 1200 meters elevation to cover the zone 200 meters lower, *i. e.*, to 1000 meters, neither the "1200" nor the "1000" line should be taken, but about the middle of both. If it is desired to obtain an accurate measurement, sight should be taken at first with the lower and then with the higher sight setting, and thus the amount of rotation necessary determined.

For instruction in deep fire, the device for aiming control for machine guns constructed by Captain Freiensehner is eminently adapted.

In instruction with this device, a board is placed, as shown in the illustration (Figure 9), in a frame under the muzzle. The pencil holder is inserted with its upper end, the fork, under the stuffing-box, so that the pencil point rests against the board. The pencil has an elastic movement to the front and is held back by the instructor with a string, and is only released to record control points or control lines.

The following can be accomplished with this apparatus:

1. *Exercises in Adjustment Fire.*

In aiming drill, with and without blank ammunition, the machine gun is aimed by the instructor with a certain sight setting at an aiming point. The instructor then marks a control point on the board with the device, and then alters the direction of the gun. The gun pointer will then be required to aim at the same point with the same sight setting, the instructor giving the proper commands as under service conditions. The instructor pulls back the string; as soon as the gun pointer calls "ready," the instructor releases the string, and the error made by the gun pointer can be seen on the board. The device permits of several sights being taken by the gun pointer without compelling the instructor to go behind the gun every time and verify the correctness of the aim.

2. *Exercise in Fire for Effect.*

The instructor aims with a certain sight setting at a target (at first located horizontally), and with the device draws on the board a horizontal line whose length corresponds to the width of the sector of the target pertaining to the gun. He then sights at the same target with 100 (200, 300) m. less elevation and draws, as before, a horizontal line on the board and marks the lateral limits of the sector pertaining to the gun with vertical lines. The gun pointer now executes deep fire with the range given by the instructor. The waving lines now formed on the board should connect the horizontal lines drawn by the instructor, and should not go beyond the vertical lines on the sides. By continuous observation of the lines now formed on the board, the instructor can constantly check the gun pointer and thus instruct him.

With targets which are not horizontal, the instructor must draw on the board the control lines of the two sights settings to be used.

(*c*) *Use of Deep Fire.*

To prevent possible misunderstanding, I wish to make clear at the beginning of this discussion that the use of deep fire does not always mean the covering of a zone at least 100 or 200 meters deep.

The extent of the deep fire is dependent on:

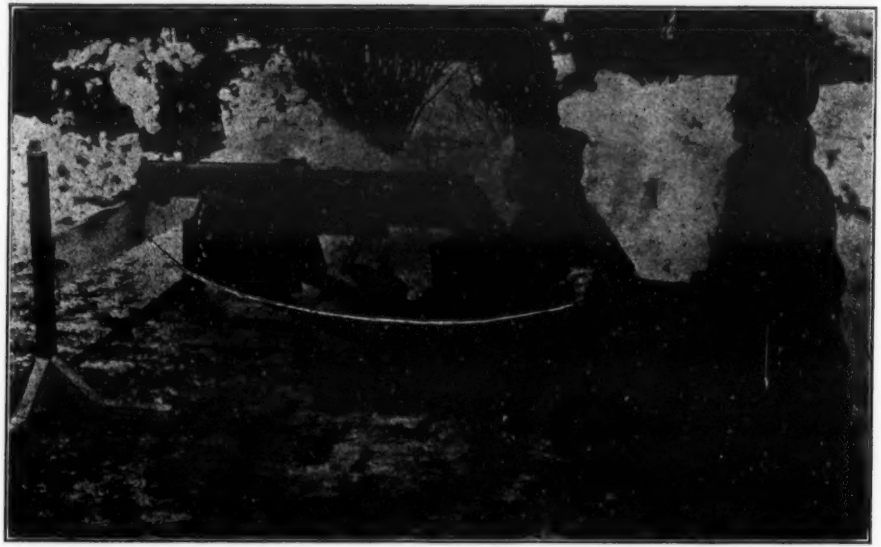


FIGURE 9.

1. Observation.
2. Target.
3. Range.

The difficulties in firing without any deep fire and the objections to it are described in more detail in Chapter 3. Should there not be such abnormally favorable conditions of observation as are necessary for such firing—which I prefer to designate as "peace firing"—the sheaf on the target must be enlarged.

There are many intermediate stages between "good observation" and "lack of observation" which permit us to get along with very little deep fire—say 50 meters.

To get a clear understanding of how little the line of sight moves with 50 meters deep fire, it is only necessary to lie behind a machine gun and execute this deep fire with 800 or 1000 meters elevation, accurately observing the handwheel and eliminating the lost motion. Deep fire of only 50 meters requires so little turning of the handwheel that the majority of officers will be astonished. An extensive displacement of the sheaf on the target is not involved; the gun commander's corrections of "higher" or "lower" often result in more turning of the wheel than is here the case. We will take as an example the most favorable condition for observation to show how much 50 meters deep fire amounts to at the target. Figures 4, 5 and 6 show the sheaf as it appears on the target. At a range of 800 meters, 50 meters deep fire causes a rise and a fall of only about 45 cm. (centimeters!) each, which can easily be seen from the table of ordinates of the trajectory. (See Appendix.) In firing at a steep slope, the sheaf is actually neither elevated nor lowered beyond the 45 cm., and who can, even with the most powerful field glasses, recognize such a small difference, or will be able to say "too much deep fire"? Transferred to level ground, these 45 cm. at 800 meters distance are changed in consequence of the flatness of the trajectory to 25 meters high or low. But again, who can even with the best field glasses determine differences of 25 meters at a distance of 800 meters on level ground?

Fifty meters deep fire is insufficient to compensate for the variations in the machine-gun sheaf as shown in Figures 4, 5, and 6. To fire with 50 meters deep fire, excellent observation must be possible. Every machine-gun commander must keep his target under constant observation, and must by continuous commands of

"higher" or "lower," strive to equalize the variations. The 50 meters deep fire only serves to counteract, to a certain extent, the observer's errors. Such small differences in the lay of the sheaf as 25 meters in depth cannot be continually discerned and corrected with the rapidity required, even with good field glasses.

The effect of fire is materially increased through the 50 meters deep fire. I have demonstrated through much firing that the gun commander often errs in judging the sheaf's position with reference to the target. He often believed himself to be exactly on the target but was actually in front or in rear of it with the narrow band. The 50 meters deep fire permits the gun commander to compensate for many of these errors; he catches the target with the end of the useful part when he would otherwise shoot over it.

I freely admit exceptions in the case of gun pointers who can hold the target for a time without any deep fire, but this only under the most favorable conditions. The majority of all gun commanders and gun pointers will, in firing without deep fire, get on the target only occasionally, crossing the target to a certain extent, though not so frequently as when using 50 meters deep fire. By using 50 meters deep fire, the average gun commander is able to bring his sheaf more frequently in the target, thus obtaining more hits.

A rule as to how much deep fire to use in every case, cannot be laid down; this depends on conditions obtaining at the time.

The conviction comes unconsciously that with use of 100, 200, or even 300 meters deep fire, the useful part of the sheaf will become so thin that no hits can be made. I ask, however, that a trial be made under the following conditions:

Target: head figures at 1000 to 1100 meters.
Observation: poor or none.
Pointers: men perfectly trained in deep fire.
Adjustment fire starts as usual by platoon or with all 6 machine guns on one point.

With no observation, the company will be given a common range and 200 meters deep fire. At the mid ranges, the reading of the range finders will be taken with due allowances for weather conditions.

With poor observation, 100 meters deep fire will be ordered, based on the adjustment fire.

In firing for effect, the gun commander and officers step out

of the line after instructing the gun pointers in the distribution of fire. The gun pointers receive strict orders to disregard all observed hits and to find the target solely with the announced elevation, and to execute their 200 and 300 meters deep fire uniformly.

The main point to be observed in this firing is the total disregard of all observation.

The result obtained can be almost exactly predicted by use of the Tables of Fire Effect, of which more will be said in a later chapter. The accuracy of the fire is, to say the least, astounding in spite of the fact that the entire procedure is based solely on a systematic, uniform distribution of hits on the target. The accuracy of fire is so extraordinarily great because the corrections of the gun commanders are eliminated, and this brings me to the main point that the gun commanders, through false corrections, often remove the sheaf from the target instead of improving it. I lay here particular stress on the firing under service conditions with poor observation.

This method is particularly adapted for instruction firing, and, as a contrast, I recommend firing with gun and platoon leaders in command, if possible without any deep fire and with poor observation. The result of this last firing will often be poorer than that of the demonstration firing notwithstanding the 100 or 200 meters deep fire of the latter. The few instances in the latter case—let us call it "accuracy fire"—in which the results are materially better than those of deep fire, are so rare that they cannot outweigh the great advantage of the certainty of effect of deep fire.

For the demonstration firing, it is recommended that 2 or 3 lines of targets be set up directly in rear of one another (not echeloned laterally) at 50 meters interval instead of one line of head figures, to show the certainty of the fire effect. In such an arrangement, it must be borne in mind that the lines placed behind one another must, of course, lie in a horizontal plane.

Deep fire against targets on uneven ground.

In mountain warfare, where the enemy is more or less equally distant but not on the same level, the use of the deep fire is of the utmost importance.

As already mentioned, at 800 meters distance and 50 meters

deep fire, the increase of the vertical diameter of the machine-gun sheaf is only 90 centimeters. Should the target rise or fall to a small extent, a resighting is necessary, as otherwise the target, despite the deep fire, would lie above or below the sheaf. The gun pointer must follow the target with the sight with the utmost care. The deep fire will contribute materially toward causing the machine-gun sheaf to pass through the target more frequently than when the gun pointer fires without deep fire at the gun commander's commands only.

[TO BE CONTINUED]

Night Signaling with Flashlight.

By 2d Lieut. G. L. Brown, 5th Infantry.

RECENT developments will be responsible for a considerable change in paragraphs 629, Infantry Drill Regulations, and 114, Field Service Regulations, when these regulations come up for correction after the war. Our policy toward night marching is thus summed up briefly in the Infantry Drill Regulations: "Night marching should be avoided when possible." Reliable information has been published from time to time to the effect that it is practically impossible to move troops during the day within the radius of the enemy scout aeroplanes and that the transfer of troops from one section of the trenches to another is always effected at night. In other words, day marching should be avoided when possible if within the range of enemy artillery.

This may seem a rather extreme view to take. However, under existing circumstances and orders, one cannot argue the case or quote specific examples, and the extreme position must be assumed in order to arouse sufficient discussion to bring about a general realization that a system of night signaling must be developed in the line of the Army.

The combination of the knowledge of these conditions, a slight acquaintance with the methods adopted by the English in the present war, and a desire to find some sort of innocent diversion to keep at least a few men away from Panama City resulted in the formation of a class in night signaling for the 5th Infantry a little more than a year ago.

The class was unofficial and entirely voluntary. No trouble was experienced in obtaining volunteers for this work. The men seemed to enjoy the night work, and judging from results obtained, were intensely interested. The class met on the average of three nights a week for two months, then due to lack of time and arrival of large armies of mosquitoes, was temporarily disbanded. About seven months later, the class was reorganized at the request of the regimental commander for the purpose of conducting certain tests of a proposed system of visual signaling in connection with the defense of the Canal. A careful

record was kept of the methods followed and work done by the class during its periods of activity. The following brief account is based on this record, and it is hoped that it will serve as an aid to the solution of the problem of night signaling:

EQUIPMENT.

Pocket electric flash lights with a lens of at least ¾ inch. We used the "Ever-Ready Tungsten Portable Light" called "The Comet," costing $1.50, extra batteries, 40 cents, and globes 20 cents.

Holders for lights were made by the company shoemakers at a cost of $1.50. This holder has two compartments, one for the light and the other for an extra battery and globe. If desired, another light complete can be carried in the extra compartment.

Standard field glasses were used for all work over two miles.

OPERATION.

To signal with the flash light, the operation of the switch is in all respects similar to the operation of the telegraphic key. A short flash for a dot and a long flash for a dash. Length of flashes and intervals between flashes necessarily depend on the ability of the receiver.

When working at distances over two miles, it will be found necessary to make a distinct pause or interval between the flashes, otherwise a series of flashes will blend together and confuse the receiver.

Always hold the light steady. If there is any motion caused by operating the switch, the light will appear to dance, even at short distances, and it will be practically impossible to read the signals.

To learn the code letters and signals by the "look" must be the aim of the beginner. Proficiency can never be obtained if the receiver always stops to count the dots and dashes.

Select a flash light for this work which is supplied with a spring switch, *i. e.*, in which the switch requires a continual pressure to keep the light on and goes out the moment that the pressure is removed. Many of the lights on the market at present require an additional pressure to turn the light off. This class should be avoided if possible.

CODE AND TRANSMITTING.

General Service Code (26 letters, 10 numerals, 3 punctuation marks, and 2 conventional signals).

The General Service Code was adopted as a matter of course, but the number of punctuation marks and conventional signals was reduced after a careful test of the system proposed by Lieut. W. R. Wheeler in the INFANTRY JOURNAL, May-June, 1915. This change was made partly to simplify matters and partly because the additional signals were not necessary or desirable in the system of transmission that was used. The punctuation marks for the period, comma, and interrogation were retained. Conventional signals for error (.....), for separating address from text and text from signature (— · · · —) and acknowledgment (long flash) were used.

Up to the time that Lieutenant Wheeler's article was published, we used the system, now used by the English Army, of acknowledgment of the receipt of each word by a long flash. The Wheeler "Repeat Letter" system was then given a trial, but was found as tedious as it was accurate. In view of the fact that one of the objects of the class was to afford amusement for the men, I was willing to sacrifice the advantages of this element of the Wheeler system in order to keep up interest in the work. We did, however, adopt his proposed modified code. The "long flash" system is a direct descendant of the Repeat Letter System.

Assume that the long flash system is being used. The sending station sends a word. If the receiving station receives a combination of letters that forms a word which seems to fit in with the message or situation, it at once acknowledges the receipt of the word with a long flash (slightly longer than a dash). The sending station then sends the next word and waits for the corresponding long flash. Now suppose that the receiving station did not "get" this word. It would not send the long flash, and the sending station would repeat the word until the acknowledging flash was observed.

It was thought for a while that we would have to fall back on the "Repeat Letter System" when sending code messages. But we finally hit on a scheme that we called the "Numeral Sys-

tem." This system is identical with the long flash, except that the sending station after completing each group of letters constituting a code word, sends the numeral corresponding to the number of letters in the group. For example: suppose that the code word is *f s t o t*. The sending station sends, "*f s t o t* —· · · (6)" and if the receiving station has received six letters, it sends the long flash. In this manner the receiving station is informed when the group is complete, given a check on the number of letters, and at the same time retains control over the sender.

Of course, the objections to these methods are obvious. The first question asked is, "Suppose that the word received, although apparently fitting in with the remainder of the message, is entirely wrong and gives a different meaning to the message" or, "The mere fact that six letters are received, using the 'Numeral System,' does not give any check as to the relation of the letters sent to those received." It is sufficient answer for both questions to compare this method of word checking with the prescribed method of using one numeral to check the entire message. However, it is not so much the checking system that insures accuracy as it is the element of control that the receiving station exercises over the sender.

When the class was reorganized in March, I found that the men had not dropped the work as might be expected but had kept it up among themselves and as a result had attained a remarkable degree of proficiency. They no longer read the letters as dots and dashes but got them by the "look," as they call it. We did not, however, drop the Long Flash System. It was found that the "control" resulting from this system was still necessary and especially so when the sender and receiver were not perfectly familiar with one another. An experience with one of our professional signalers will illustrate this point. A Signal Corps sergeant was sent to the Post to give us special instruction in the use of the heliograph and acetylene light. One of the first things he told us was to learn the initials of all the men in the class so that when a message was started, we would know at once who was sending and what to expect in the way of speed and timing. He then added that in the Signal Companies, everyone knew the peculiarities of everyone else when sending

messages. Could this condition ever be possible in the line? This misplaced idea of team work is necessary to the success of the present authorized system and is obtained to a certain extent in the company signal squads of two or four men. But let these squads try to send to another company and see how far the team work goes. An excellent example of this result was the last Inspection Test of this Regiment. Companies signaled to each other. The companies that had recently won the signaling events in a Regimental Field Day were commented on unfavorably and reported deficient. This fault would be remedied somewhat by the formation of a regimental signal squad as proposed by Lieutenant Wheeler, but this would not remedy conditions if communications had to be established with another regiment. Some system must be prescribed by which the receiver can exercise control over the sender at all times and automatically.

With a view to giving the Long Flash and Numeral Systems a fair test, we not only used the flash lights but heliographs, acetylene lanterns, four-foot flags, automobile headlights, and bicycle lamps. The last two were used with the shutter. With the flags, the short and long wave system (English) was used. It was found that our systems worked without a hitch in every case.

PRACTICAL RESULTS AND USEFULNESS OF FLASH LIGHTS.

In the meantime, while developing a system of transmitting, an effort was made to determine the tactical usefulness of night signaling. The numerous impediments that were encountered when the class was unofficial were removed when the official reorganization took place last March. Support and encouragement given by the regimental commander and by the Chief Signal Officer of the Zone, made it possible to change what had previously been a pastime into serious business. When possible, work was carried out under service conditions. Problems in night advance-guard work were attempted. Night outpost and patrolling problems were taken up. Brief conclusions resulting from this work are as follows:

1. Maximum distance that signals (with the light used) can be read with the naked eye: 2½ miles.

2. Maximum distance that signals can be read with standard field glasses: 4 to 7 miles (depending on conditions).

3. Maximum distance that light was seen with glasses but not read: 9½ miles.

4. Average rate using the long flash system: 5 words per minute at distance of over two miles.

5. The flare from the light of a man sending from the front to the rear cannot be observed by the enemy unless there is a tree or other obstruction to the front or side of the sender that would reflect the light to his rear.

6. The obvious objection to any form of night signaling is that the enemy can observe the signals coming from the rear toward the front. This drawback was greatly eliminated by observing the following rules: Never signal from the rear toward the front unless absolutely necessary. Except in great emergency, signalers in the rear of a column or position will never call to the front unless an advanced signaler has established station and indicated willingness to receive by sending GA after his call letters, thus: *AP GA* (Advance Party station established, go ahead). Advanced signalers will at every opportunity establish station as just described when they find themselves in such a position as the top of a hill or a sharp turn in a road or where they have reason to believe that signals from the rear cannot be seen by the enemy.

7. By taking a position near street lights, lighted buildings, or fires, it is practically impossible for anyone to read the signals. Such a position should never be taken except when it is desired to prevent others from reading the signals and the position has been pre-arranged with the receiving station.

8. Advance Guard Problem: All halts and advances ordered were transmitted to the elements of the column by flash signals, doing away with the usual confusion and noise. All information obtained by the advance-guard commander was sent to commanding officer by flash signals. As the head of the main body reached cross-roads and forks, all elements of the column were notified as to the correct route by flash. The advance party took the wrong road and was at once notified by the advance guard commander by flash signals.

9. Outpost and Patrolling Problems: All information gained

was sent back without delay by the flash signals. Communication between all elements of the outpost was kept up at all times by the signalers. It was found that we were somewhat limited in this work, due to the fear of disclosing our position to the enemy. However, all messages from the front to the rear could be sent with perfect safety.

10. An additional usefulness of flash light signals was found in the control and direction of motor-truck columns when traveling at night.

11. Advantages of the pocket or portable flash light over other methods of night signaling are obvious. It has practically no weight and can be carried in the pocket if the more convenient holders cannot be obtained. It costs almost nothing and can be supplied to all signalers. It has no mechanical features that require special knowledge. Once a man has become proficient with his flash light, he can operate and read either the heliograph, acetylene light, or navy blinkers without further practice. Organizations that are not supplied with the acetylene light can take up night signaling with the flash light without regard to the Signal Corps. Work with the flash light will prove specially interesting for the militia and other organizations that are forced to do a great deal of their training at night.

Bayonet Mêlée

By Major L. S. Upton, 10th Infantry.

BAYONET fencing is recognized by all as very important, and keen interest is taken in it everywhere in the service. The man who knows the offensive value of his rifle and bayonet and can use them to the greatest advantage has an added confidence that makes him eager to close with an enemy and decide the fight with the bayonet. After the rudiments are taught and even after a man has been taught to fence skillfully, there remains the knowledge of how to use the weapon in a mêlée, and but little instruction along these lines has been given. One great drawback is the danger of serious injuries, and no scheme has yet been devised that will permit instruction to be given by actual combat, man against man.

To facilitate this instruction, the following scheme has been tried out with success. Dummy figures are made out of 4 x 4 timber about two feet high for the low figures and five feet high for the high ones; they are used for the low points and cuts respectively. They are wrapped with grain bags and stuffed with excelsior to about the size of a man's body and are set up on 2 x 4 cross pieces at the bottom, which are braced to the uprights. The cross pieces should have a length of fifteen inches on one side of the upright and should be sawed off to a length of four inches on the other; the short ends should be placed toward the course to avoid tripping the soldier in running (see Figure 1). At first, the bottom pieces were of equal length and frequently tripped the runner. In this figure, the soldier has just struck the figure which is falling, and the clearance of the soldier's foot is seen. To teach parrying at a run, a hanging figure was arranged as shown in Figure 2. This is a piece of 4 x 4 padded as shown and hung from a support by a piece of window cord or stout rope. It can be swung from the branch of a tree if one is available. It is used either still or swinging; in the former case, the man passing under it at a run has to parry high to clear it out of his way as he passes it; in the latter case, he must use the appropriate parry to avoid being struck by it.

FIGURE 1.

The figures and hurdle are eight in all and are set up in a course which should be about one hundred yards long at first, afterwards gradually extended. On hundred yards will give an interval of about twelve yards between figures. The figures on the course were placed as follows: First a low figure on the runner's left for left point; then a high figure on his right for right cut; then high figure on his left for left cut; then low figure on right for right point; then the swinging figure for parry high; then the hurdle; then the high figure for butt strike; then the ditch to be jumped and a low figure on left for a left point while jumping to simulate jumping a trench and striking a man at the same time. The fencing rifle without bayonet or old service rifles with bayonet can be used as desired. Service rifles were in some respects found to be unsatisfactory, for the bayonet stuck into the wood of the low figures and the stocks broke easily in the butt strike; nevertheless, I think that the sticking of the bayonet in the wood is a good thing, for a man must know how to disengage his bayonet in an actual fight, and he should learn how to do so in practice.

The figures should not be too far apart in width of the course, as this will cause a man to run a zigzag course. Squads are drawn up at the start, and the various cuts and blows are explained; then the men are required to go down the course one at a time at a fast run and deliver the blows. A man stationed at each figure sets them up as fast as knocked down so that there is no delay. Most men at first are found to overrun their figures before starting their blows, and consequently the cuts are delivered after the man is past the figure. This is because they fail to make allowance for their speed and generally start their cuts when they are at the figure instead of before reaching it. The average man runs about fifteen feet a second, and if he starts his blow a third of a second too late, he is five feet too far beyond to deliver it well.

In jumping the hurdle, the men should be cautioned to let go the rifle with the left hand and carry it naturally with the right. Jumping with the rifle in both hands resulted in many bad falls and requires much greater exertion.

At first the men were awkward and would frequently miss their blows, but a few times through the course improved them, and they soon became proficient and learned to deliver every

FIGURE 2.

blow with accuracy. It is a question of balance and timing of blows, and unless it is taught them in some such way as this, the men will never learn it, for bayonet fencing will not give it to them. It should be said, however, that the good fencers are the most proficient in these exercises and can always be distinguished from the poor ones the first time they run.

Power Traction in War.

By Colonel E. A. Root, 30th Infantry.

IN LINE with the article under the above title appearing in the INFANTRY JOURNAL for May, 1916, some very interesting experiments and tests were made at Fort Sam Houston and San Antonio, Texas, during the latter part of May, 1916, under the direction of Major General Frederick Funston, U. S. Army, by Colonel Harry L. Rogers, Quartermaster, Southern Department and the 30th U. S. Infantry, which at that time was camped about a mile east of the southeast corner of the reservation.

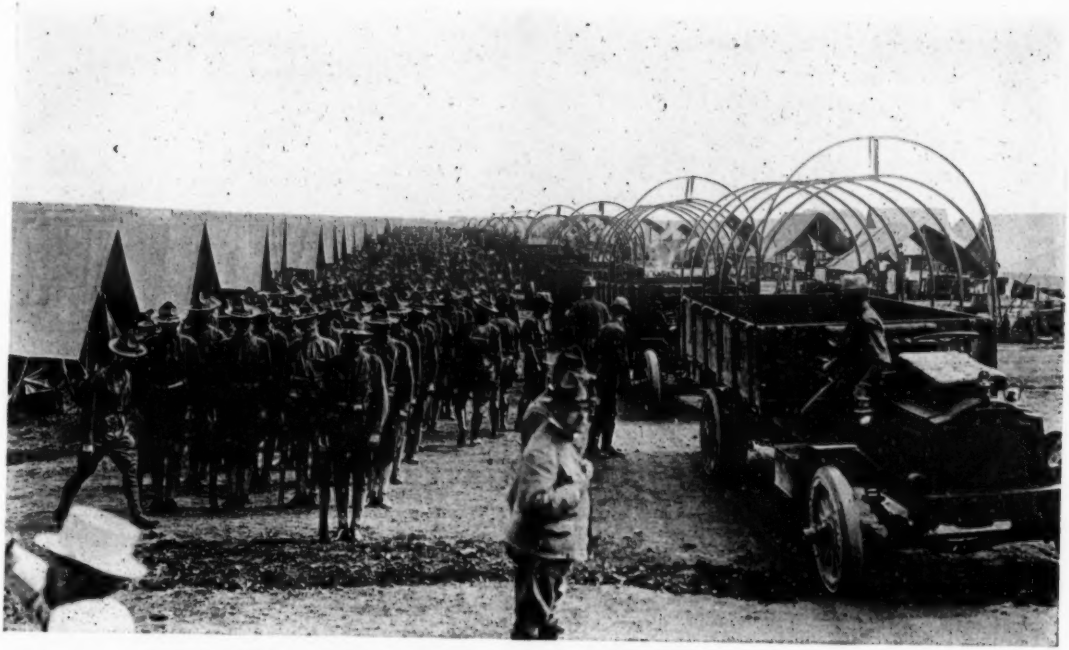
Experiments were made to ascertain just how many infantrymen in full field equipment could be carried on a motor truck, as a basis for determining how many trucks would be required for the rapid transportation of a company, a battalion, or a whole regiment of infantry; two 3-ton Packard trucks were used by the 30th Infantry for this purpose. On entrucking the men in different ways and making short runs, it was found that 24 men could be very comfortably carried in a single truck seated on the floor of the truck, while with the bows on the truck for the men to hold on to and steady themselves, 35 men could easily be carried standing. The men could be carried seated for almost any length of time without appreciable fatigue, but standing they might become rather tired if moving over rough roads for more than a few hours, although they could probably stand it for a short time without serious hardship. In these experiments, different methods of entrucking the men quickly were tried, as from the rear with the tail gates down, over the sides and rear, and from the front only. Considering the time taken to put up and fasten the tail gates after the men were in, it was found they could be entrucked from the front quicker than in any other way. This might not be so, however, with trucks other than the Packard. Thirty-five men in column of squads on the right hand side of the truck were entrucked from the front in 40 seconds with no bows on the trucks, and in 50 seconds with the bows on. At the command to entruck, all ranks faced to the left, and each rank in turn in column of files one after another got

aboard as in running up a stairway, each man starting with his left foot on the step of the truck, then right on floor of truck, then left on seat of chauffeur and throwing right foot over the end into the truck and passing to the rear out of the way of those following.

On the above basis of calculation, to transport a whole regiment, 24 trucks would be required for 12 companies of 70 men, 2 trucks for the Machine-Gun Company with 4 guns and 50 men, and 2 trucks for the Band (28 men) and Sanitary Detachment (16 men), or 28 trucks in all.

With this number of trucks, it was planned to transport the entire 30th Infantry some distance into the country, form for attack, and return to camp. As this test was to represent a hurried response to a call for reinforcements at some distant point, with a possibility of being ambushed or delayed en route, and a dash into action at the end, a march formation was planned with an advance guard and main body. The advance guard, to consist of one battalion and Machine-Gun Company, was to be divided into support and reserve. The advance party of the support of one-half company in one truck was to be preceded at 1000 yards by two scouts on motor cycles and followed at 600 yards by the rest of the support of one and one-half companies in three trucks.

The reserve of two companies in four trucks and the Machine-Gun Company with four guns in two trucks was to follow the support at 800 yards. Between the reserve and support, the advance-guard commander with his adjutant and an orderly was to ride in a Dodge touring car. The main body, consisting of the other two battalions of the regiment, the band and attached sanitary troops in 18 trucks, was to follow the advance-guard at 1000 yards. Two motor ambulances were to close the column. Between the advance guard and the main body, the colonel, lieutenant colonel, adjutant, and an orderly were to ride in one Dodge touring car, and the commander of the leading battalion his adjutant and an orderly in another Dodge touring car. Between the two battalions, the commander of the last battalion with his adjutant and an orderly was to ride in a Dodge touring car. The company officers and sanitary officers were all to ride beside the chauffeurs on the seats of the trucks carrying their respective men and detachments. A bugler with a flag was to ride on each truck just behind the chauffeur to watch for signals from the



30TH INFANTRY IN COLUMN OF SQUADS PREPARED TO "ENTRUCK."

front and to repeat the signals to the rear, or to signal to the rear if anything happened on his truck to make such action necessary. One man was to be detailed in the rear of each truck to watch for signals from the rear to be repeated forward.

For this test, Motor Truck Company No. 12, consisting of 28 Packard 3-ton trucks, to which two motor ambulances were attached, were brought to the camp of the regiment. The regiment was formed in column of squads in the company officers' street of camp, subdivisions and organization in their proper order in the march formation, without distances. The trucks were run from the rear in column on the left flank of the regiment, each truck halting opposite the head of the subdivision to which it was assigned. At the signal for entrucking, the entire regiment faced to the left, and one rank after another in single file of each subdivision boarded its truck quickly and without loss of time or confusion. The entire regiment was thus entrucked in one minute. This done, "*Forward,* MARCH" was sounded on the bugle, and the trucks began moving out of camp, taking the distances on the road prescribed for the march formation. The point selected for the supposed reinforcement and attack calling for the presence of the troops was at some seven or eight miles from camp on the outskirts of the west side of San Antonio, and the route led through the business part of the city, crossing the main lines of two railroads and several street car lines, on streets where street cars were running. To avoid delays and possible accident by the traffic trying to cross the column between the intervals in the original formation, the head of the column was signalled, on passing Fort Sam Houston, to slow down until the entire column was closed up to about three truck lengths between trucks. When this was done, on a signal passed to the front, a speed of about 12 miles per hour was taken up all along the column and maintained, with the exception of one or two short delays at railroad crossings, through the principal business part of the city, on passing which the speed was increased to about 14 miles per hour, although still within the city limits. The rate could have been increased to the limit of the speed of the trucks had it been necessary.

The head of the column arrived at the point selected in 38 minutes from the signal in camp to entruck, and halted; the trucks in rear closed up to within a few feet from the ones in

30TH INFANTRY IN COLUMN OF SQUADS PREPARED TO "ENTRUCK."

front. The advance guard detrucked as soon as its trucks halted and was deployed in attack formation and moved forward; the leading battalion of the main body detrucked and moved to the left flank as a support; and the rear battalion detrucked and formed as a reserve in rear of the right flank. The sanitary detachment and band attached to it for duty detrucked and prepared to establish regimental aid stations. By this time, the advance skirmish line was some 300 yards to the front, and the time taken was just seven minutes. Halt, assemble, and recall were sounded, and the troops returned to their respective trucks and entrucked again in eight minutes; the entire time consumed from the signal to entruck in camp was just one hour. The return journey to camp was made more slowly, and including turning around by a short detour of the road and back on again, consumed exactly one hour.

The detrucking and forming for attack was effected without confusion or mixing of the squads of the companies, the men taking their proper places promptly upon leaving the trucks as when forming in their company streets.

The assembly and reentrucking was likewise done with the same celerity and order and without confusion. On the return journey, running slowly through the city with the trucks closed up to distances of about three truck lengths, the column took three minutes and fifty seconds to pass a given point.

At 4.45 p. m., June 15, 1916, the 30th Infantry received orders to prepare to entrain the next morning for Eagle Pass, Texas. At this time, one battalion and the Machine-Gun Company were at the Leon Springs target range, 24 miles from camp, engaged in rifle practice. Orders were telephoned to strike tents and prepare to return to camp as soon as transportation could be gotten to them. Motor trucks were started to Leon Springs from Fort Sam Houston about 6 o'clock p. m., and by midnight all the battalion and Machine-Gun Company, except the mules of the latter unit, were back in camp with all their tentage and equipment (the rolling kitchen hitched behind a truck), ready to take the train in the morning for the move to Eagle Pass.

A report was received at Eagle Pass a short time ago of an expected bandit raid across the Rio Grande in the vicinity of Del Rio, some 61 miles up the River. Three companies of the 3d Infantry were entrucked in some of these same 3-ton Packard

trucks and delivered at the menaced point in 5 hours and a few minutes. This journey was made at night and over an unknown and only fair road.

Many other similar cases could be cited of the great advantages of using motor trucks along the Mexican border, where a few have been available when wanted, for transporting foot troops quickly and in considerable numbers in emergencies, more quickly even than cavalry could have covered the distances, and bringing the men to their destinations nearly as fresh and fit for business as when they started. There can be no more doubt about the great efficiency and utility of motor trucks for transporting foot troops than there is now of their efficiency and utility as carriers of supplies of all kinds for troops of all arms in various localities. The relative economy of the truck as a means of increasing the mobility of troops should lead to provisions for adequate motor transportation for infantry regiments.

First Aid Contests.

By 1st Lieut. C. Amos Shephard, U. S. Army.

FIRST aid to the injured is recognized as a most important feature by civilian organizations as well as by the Army, and to cope with the injuries that are liable to occur in the mining industry, these companies have perfected a system of first-aid work that compares favorably with the best efforts of the Hospital Corps. This work is in charge of a skilled safety expert, who is aided by the mine doctors, and the instruction is supervised by the United States Bureau of Mines. Daily instruction is given to classes of miners, and especially selected men are chosen who comprise a first-aid team. These men are ready to repair at all times to the scene of an accident where they administer first aid to the stricken man and prepare him for transportation to the hospital, if necessary.

In order to show the proficiency attained by these teams, a first-aid contest was recently held at Ironwood, Michigan, on the occasion of the annual convention of the Lake Superior Mining Institute. Fourteen teams were entered by mines in Minnesota, Michigan, and Wisconsin. The contest was directed by Mr. Edwin Higgins, superintendent of the district mine rescue car, and the judges (seven doctors) were presided over by Dr. A. F. Knoefel, President of the American Mine Safety Association, who awarded bronze red cross medals to the winners.

This article is written in order that officers of the Army may know what is being done in first-aid work by civilian companies and also in the hope that the work as outlined will serve as a suggestion and guide to first-aid contests which could be held in the Army as part of the field day program. Preparation for this event would serve as a stimulus for first-aid instruction in the organization, as the preparation of a team of highly competent men for the contest would require special study and knowledge on the part of commissioned and noncommissioned officers, thereby increasing their value as instructors and as practical workers.

The team is composed of six men, one of whom is designated as captain. He controls the working of the team, selects the members to perform an event, issues the proper material, and in team events, gives the proper commands when these are called for. A "patient"

is also a necessary adjunct to every team; he is clad in tights, and treatment begins with the assumption that all tight clothing which would interfere with breathing and circulation, has been removed and that all clothing over the injured parts has been cut away. Members of the team all wear a prescribed uniform, in this case consisting of white duck coat, trousers, cap, and shoes.

As stated before, the captain designates the members who will take part in an event and may select himself for any or all of the events. As this rule has led to the practice of selecting some one particular star to participate in the individual and small-team events, the Committee on Arrangements is planning to number the contestants and designate the number or numbers who are to perform. This will require every member to be equally proficient and will block a "one-man team" from winning.

The exhibition field is marked off into compartments, 12 by 10 feet, numbered in pairs. Each team is allowed two compartments, one for material and one to work in. The teams are required to bring their own first-aid material, including bandages, splints blankets, stretchers, gauze. Triangular bandages are the standard, and are used in preference to any other, although equal credit is given for the proper use of the roller bandage. All splints must be fully prepared on the field during each event requiring their use; specially designed splints may be used, but they too must be assembled during the event, and the same rule applies to padding. No event can be started with bandages already folded, and after each event, if any material is to be used again, it must be returned to its original condition. This, of course, does not apply to seals and wrappers.

A time limit is set within which each event must be finished, and sufficient time is always allowed, as the event is a contest of skill and carefulness rather than one of speed at the expense of throughness. There is a penalty, however, for failure to finish an event within the allotted time, one point being deducted for each additional minute required. None of the teams in this contest used up all their time allowance, and a number of them were through before half the time was up.

The problems are prepared in advance and are entirely unknown to the contestants until the event begins. At the striking of a gong, typewritten copies of the event, in sealed envelopes, are handed to every team captain, and two minutes are allowed to

read thoroughly and discuss the problem and select the material needed for the event. The patient in the meanwhile has taken his place in the working square, flat on his back. A blanket, paulin, or oil-cloth covers the ground on which he lies. At the end of the two minutes, the gong is struck again, and time is taken. The members who are to perform the event, immediately step into the working square and approach the patient with the equipment they are to use. After they reach the patient, they are not allowed to leave him to procure additional or extra material; they must think of this beforehand, for penalties are given for failure to have sufficient and proper material. The problem also states the time allowance, so that the contestants know how fast they must work, and for this purpose, they are allowed to consult watches. The captain or other members of the team are not allowed to prompt the person or persons performing, although in team events, the contestants are allowed every latitude in this respect. At the completion of each test, the team captain raises his right hand and announces his team number. The team remains at its post in the working compartment until relieved by the judge. A gong announces the expiration of the time allowance for the event.

No practicing is allowed on the field before any of the contests or during the two-minute consultation period; no equipment can be borrowed, and all coaches and trainers must remove themselves from the immediate vicinity of their team. Any team that receives advice or coaching, is disqualified, and no outside conversation is allowed except with the judge. He uses his own judgment as to whether or not he replies to any question.

A doctor or any other experienced and qualified person acts as judge and performs his work progressively, judging as many teams in each event as may be determined and announced beforehand. In practice, it has been found that two teams are about as many as one judge can carefully handle. In events requiring resuscitation, rescue of patient, and stretcher drill, the judge may require teams to perform separately, allowance being made for the time the second team is kept waiting. Each judge will record on a regular form the team number, event and discount for each team and deliver same to the recorder, properly signed. The recorder then foots up the discounts and subtracts the same from 100 (this being the value of each event); the result is the number of points earned by the team. After all the events have been completed,

the total points are divided by the number of events, and the quotient will be the average for each team for the entire contest. In case of ties for any place, the teams involved must re-contest, a special problem being given. In order that every team may receive the same quality of marking, the judges change after each event.

The problems worked out at Ironwood, Michigan, were as follows:

PROBLEM 1.

One-man event. Miner found at a distance of twenty feet in closely caved workings with palm of right hand lacerated and bleeding profusely; in shock. Treat and transport to more open workings; carry twenty feet by shoulder lift. Time, 15 minutes.

PROBLEM 2.

Three-man event. Miner found in caved drift (2½ to 3 feet high) in bad air after explosion of powder; unconscious from gases; burns of face and hands. Transport twenty feet and administer artificial respiration, Schaefer method; treat burns. During transportation one of the rescuers is overcome; unconscious; administer proper treatment. Time, 15 minutes.

PROBLEM 3.

Team event. Miner caught by fall of rock; left ear torn off; left shoulder dislocated; left thigh broken in upper third of leg, (compound fracture), with profuse bleeding; in shock. Treat and transport on improvised litter. Time, 15 minutes.

PROBLEM 4.

Team event. Miner walks into blast; face badly lacerated over left cheek-bone, with profuse bleeding; severe laceration of upper part of abdomen; back of right hand lacerated, blood oozing; fracture of right knee-cap; unconscious from powder gases. Treat on spot, gas having cleared away, and transport forty feet. Time, 20 minutes.

The work in all of the events showed great proficiency and intelligence. In problems 1 and 2, the only penalties given were due to the fact that the contestants failed to carefully read the conditions of the problem which specifically stated that the miner was found in closed workings. This state of affairs necessitated dragging the

patient some distance before transportation by the shoulder lift, as the latter was of course impossible in a caved drift less than three feet high. In problem 4, the heaviest penalties occurred through several of the teams using the wrong method of artificial respiration. As the patient was unconscious from powder gases, it was necessary to revive him, and as the problem also stated that there was a severe laceration of the upper part of the abdomen, great care had to be taken in using the proper means of revivification. The use of the pulmotor was barred. Most of the teams used the Schaefer or prone pressure method of artificial respiration, but in this case it was held that the Sylvester or arm method was the proper system to use because of the abdominal injuries. Those teams which used the former method, thereby exerting pressure on parts already injured, were heavily penalized.

In one of the teams, the patient knew that the wrong method was being used on him, and he also knew of the penalty given for assistance lent by patient; in order to get his team to use the other method, he complained that they were causing him pain. The judge, however, held that inasmuch as the patient was supposed to be unconscious, he could do no talking. In another case, stimulants were given the patient before he was revived. The judge pointed out that this would choke the man, but the patient, anxious to save his team a penalty, denied that he was choking, although he was supposed to be unconscious at the time.

The general excellence of the work and the keenness of the competition may be judged by the fact that there was a range of only nine points between eleven of the contesting teams, and even at that there were three teams who had to work off a tie. This tie was settled by a verbal problem requiring the teams to give first aid to a patient with arterial bleeding from the head which required checking by pressure on the carotid artery; the application of a tourniquet on the brachial artery of the left arm; bandaging the right ear which had been nearly torn off; and application of splints to fracture of the upper right arm and fore-arm.

From the problem as given, it will be seen that the contesting teams had no easy task, and in order to attain a high mark, it was necessary for them to be thoroughly familiar with their duties.

Below is given a table of discounts or penalties which seems to cover almost every mistake a team could make.

JUDGE'S REPORT.

Event	*Team*	*Discounts*
1. Not doing the most important thing first		6
2. Failure of captain to command properly		1
3. Slowness in work and lack of attention		2
4. Failure to cover wound entirely		4
5. Ignorance of location of injury		4
6. Ineffective artificial respiration		11
7. Splints improperly padded or applied		6
8. Tight, loose, or improperly applied bandages		5
9. Insecure or "granny" knot		4
10. Unclean first-aid material		3
11. Failure to have on hand sufficient and proper material		3
12. Lack of neatness		2
13. Awkward handling of patient		4
14. Assistance lent by patient		3
15. Torniquet improperly applied		7
16. Failure to stop bleeding		8
17. Not treating shock		5
18. Failure to be aseptic		7
19. Improper treatment		12
20. Failure temporarily to control hemorrhage previous to application of tourniquet		7
Total discounts		

Judge ————. *Percentage*———.

The "Kick" of the Gun.

By Edward C. Crossman.

NOT the most pleasant part of shooting the military rifle is the vicious backward drive of the steel-shod butt against the muscles of the shoulder when the trigger is pressed. Not only is it bruising to many men, but coupled with the bellow of the rifle, it is a shock to the nervous system.

Queerly enough, the evils of the recoil of the modern military rifle are cumulative and result at the end of a day's fighting in a state of complete exhaustion, while the shooting of infantry falls off badly toward the end of a long day.

Experiments at the American School of Musketry at Monterey demonstrated that the limit of endurance for the normal man in normal frame of mind lay at about three hundred rounds per day. The writer, liking the rifle-shooting game and having shot a considerable number of rounds through the military rifle in a single day, was inclined to disagree with this until trying in an experiment the firing of 90 rounds in forty-five minutes. This firing, done in the Casey Firing Problem at Camp Perry, was at a group target 1200 yards away and with a platoon of infantry under normal battle conditions, save for the return fire which was luckily missing from the program. The end of the firing found the writer, at least, very tired, the arms, shoulders, and the whole nervous system being absolutely exhausted from the effort of holding the rifle and enduring the strain of the recoil.

The normal rate of fire allowed in the American service for infantry engaged, is not to exceed two shots per minute except at close quarters or other extraordinary situations. This rate of fire uses up one hundred and twenty rounds per hour, and two or three hours' continuous fighting at this rate would find the infantry exhausted and its fire falling far below what it would be when the troops are fresh.

To cover preparations for an attack, to discourage preparations on the other side for an attack, or to keep the attention of the enemy engaged while some pleasing program is being prepared for him at a different portion of the line, the Allies use continuous rapid fire by infantry. In such circumstances, the infantrymen

stand and fire steadily from their loopholes across the opposing trenches, keeping the air above the opposing parapet full of hissing bullets so that the first rush from the trench would be crumpled before it started. Two rifles per man must be used because of the heat of firing, and the rate is more rapid than that of the prescribed American fire. From such seances, even though they neither press home nor suffer an attack, the infantrymen return exhausted and glad to crawl into their straw beds when their relief from duty finally comes.

The Japanese troops went into action with 350 rounds per man in some of the hottest battles of the Manchurian campaign against Russia, and some of the regiments had expended their last round by noon. By American findings, they should have been exhausted from this cause alone, but here we have the extraneous factors of the excitement of battle and the lighter recoil of the Japanese service rifle, neither present in the American tests.

From every standpoint, recoil, weight of ammunition, weight of rifle, and cost of ammunition, the smaller calibers than the present .30 of the American service are being proved desirable.

From the standpoint of recoil alone, the change is worth while, if we accept as true the American findings as to the endurance of troops to recoil.

The "kick" of a rifle is purely a matter of reaction of powder gases, action and reaction being equal, drive at the base of the bullet and the breech-closing mechanism being the same. The final blast of the gases of explosion against the comparatively solid body of air aids in the backward thrust of the rifle.

In the American service, the formula for obtaining the backward speed of the rifle in feet per second is as follows:

$$Vf = \frac{wV + 4700\overline{w}}{W}$$

in which formula Vf is recoil velocity in foot-seconds, V muzzle velocity of bullet, w is weight of bullet in grains, $\overline{w}$ weight of powder in grains, and W weight of rifle in grains.

Taking the American service cartridge and rifle, we have w equal to 150 grains, $\overline{w}$ equal to 50 grains, and W equal to 9 pounds on the average, or 63,000 grains. The figure 4700 is a factor for smokeless powder arrived at by experiment. For black powder, the factor 3,000 is used.

Using these figures, we obtain for the American rifle a recoil velocity of 10.2 feet per second. Reducing this to energy figures of foot-pounds is of course merely squaring the velocity, 10.2, multiplying the result by weight of gun in pounds, and dividing by 64.4, giving us 14.6 foot-pounds energy developed by the rifle in its recoil travel.

A foot-pound, it may be noted for the refreshing of some memories, is the work required to raise one pound a foot. Therefore, the drive of the American rifle would raise nearly 15 pounds a foot in the air.

The Japanese rifle, on the other hand, a .25-caliber weapon using a bullet of 162 grains at 2400 feet-per-second velocity, has a free recoil velocity of 8.70 foot-seconds, and a recoil energy of 10.3 foot-pounds, but 72 per cent of the recoil of the American rifle. This pertains to the older type of cartridge used during the Russo-Japanese war, prior to the adoption of the spitzer or pointed bullet.

The recoil of the French rifle is undoubtedly heavy. The recoil velocity of the arm is nearly 11 foot-seconds, and the recoil energy 17.2 foot-pounds, about 18 per cent more than the "kick" of the Yankee gun and 67 per cent more than that of the Japanese rifle. This weighty come-back is due to the heavy bullet, a missile of 195 grains with a muzzle velocity of 2400 feet per second.

While a grown man, husky and inured to hardship, is sensitive to the recoil of the service rifle and while about three hundred rounds is the limit for a day's firing, yet strangely enough the recoil in foot pounds of the 12-bore shotgun and the normal trap-shooting cartridge is nearly double that of the rifle and is taken without a murmur by the thousands of trapshooters about the country. I know of one woman trapshooter weighing less than one hundred pounds, who shoots 200 shells a day for a three-day trap-shooting tournament through her 12-gauge trap gun. The recoil of the trap shooting shotgun cartridge ranges from 25 to 30 foot-pounds according to the load and the weight of the gun in which it is fired. Were the rifle fitted up in lines and handling like the trap gun and fired from the same position and with the same swing, its kick doubtless would not be noticed. Conversely, were the shotgun made in rifle outline and fired deliberately and with careful aim in the rifle position, it would prove unbearable.

Evidently, the position has most to do with the difference in the discomfort from the recoil of the two arms; the shotgun is fired

with the muscles tensed and body moving, in other words, the shock is taken by a set of tensed springs; the rifle is fired with the muscles relaxed, fired deliberately and with the nerves knowing that when the final pressure on the trigger is hard enough, a heavy shock will be inflicted. The straighter stock of the shotgun, keeping the line of support of the gun as afforded by the shoulder more in line with the direction of recoil, aids in imparting the shock simply to the shoulder without the added influence of a vicious "rear-up" because the line of resistance is far below the line of recoil.

The Maxim silencer has much effect in reducing recoil, the theory being that the gases, impinging on the discs of the cylinder, actually drag up the rifle and help to resist the backward thrust of powder gases within the bore, as well as to eliminate the portion of recoil caused by the gases impinging on the resisting air at the muzzle.

While the silencer actually does cut down the weight of the recoil, it is my impression that reduction of some of the savage bellow of the short-barreled rifle has much to do with the lessening of the shock. Some years ago I tried shooting the army rifle for an aeroplane to see whether accuracy could be obtained from an aeroplane at top speed. The exhaust of the great tractor, of course unmuffled, was close to my head, and the noise of the propellers added to the row. The first shot I fired made not a sound so far as my hearing it was concerned, because of the noise of engine exhaust and propeller roar. Also to my great surprise, the rifle did not recoil, and not until I opened the bolt did I believe that the shot had gone. A half-dozen other shots corroborated the impression that the recoil of the rifle had nearly all disappeared.

While the excitement of the rather novel position in firing from the bow of a flying aeroplane at a target far below me had something to do with the lessening of the shock, yet I am satisfied that the disappearance of the bellow of the rifle had much to do with the apparent reduction of recoil. As I have pointed out before, if a boxer had an accomplice yell violently in your ear every time a glove landed on you, you would be persuaded that the blows had much more force than when they landed quietly.

The noise of the military rifle, particularly the American 24-inch barrel Springfield, is very violent. The huge powder charge of 50 grains does not burn completely as it does in a longer barrel,

while the gases rush out into the air at tremendous pressure compared with the pressure of the longer tube. When they emerge into the air, they are still under a pressure of nearly 19,000 pounds per square-inch.

Hence the kick of the rifle is accompanied by an ear-splitting crash, a shock to the nervous system, which is actually painful to some ears. So the silencer works in two ways in diminishing the recoil effect, one by cutting down the weight of the thrust, the other by relieving the ears of the bellow of the gun. As with the exhaust of the aeroplane motor, the noise of the rifle is less distressing, as it is covered up by other equally loud but continuous noises.

For this reason, the recoil of the infantry rifle in trench fighting or in other forms of active engagement is probably less distressing when merely part of the general roar than it is when fired alone with the nerves waiting in a dead silence for the bellow that is to follow pressing the trigger.

However, the very fact that military authorities dislike to take up a rifle and cartridge giving more than 15 foot-pounds recoil energy, and the fact that lightening of both rifle and ammunition is urgently needed, both go to show that the next change in our rifle should be toward a still smaller caliber than the .30, either the .25 or the .23.

The .25 is in use by Italy, Japan, Holland, and Greece. By none of these nations is it carried out to its logical development ballistically. Most of them cling to the ultra-heavy bullet of about 160 grains, developed twenty years ago, instead of evolving a sharp-point bullet of the same relation of weight to diameter as is the case in the American and the German bullets.

Given a bullet with the same relation of weight to diameter as the American bullet and with the same sharp point, it will range just as far and shoot just as flat as the American bullet when driven at the same muzzle velocity. The .25-caliber bullet of 109 grains would equal the American .30-caliber bullet of 150 grains, so far as proportion of weight to diameter is concerned, while the more sensible bullet of 120 grains in the .25-caliber would equal the 170-grain bullet in the .30 caliber. So with a point-blank reduction of 30 grains to start with, the .25-caliber rifle gives us a bullet of better weight proportion and therefore better

carrying qualities than the present American service bullet, points being the same.

If no other benefit were derived, the reduced bullet would mean a reduction in ammunition weight of about 8 per cent, or an allowance of eight more cartridges to each hundred without running up the weight. However, reducing bullet weight means reducing powder charge and case, so that our 120-grain .25-caliber bullet would mean a total reduction in weight of about 50 grains to the cartridge, which is a reduction of 12½ per cent.

If the velocity of the bullet is raised to 3,000 feet per second, the present velocity of the German Mauser, and the weight of the rifle is reduced to 8 pounds instead of about 9 pounds, then the recoil is 13 foot-pounds instead of more than 14, the rifle is a pound lighter enabling the soldier to carry more ammunition, cartridges weigh 12 per cent less than the present cartridges of our service, and the bullet is more effective ballistically.

The trajectory is cut down from 24 inches to about 17 inches in flying 500 yards, steel penetration is increased, and the sole penalty we pay for reduction in weight of rifle, recoil, and ammunition, with the ballistic advantages gained, is that we make only a .25-caliber instead of a .30-caliber hole in the fellow who does not think our way. As the Japanese against the Russians and the Italians against the Austrians have been fairly successful with the quarter-inch caliber, and as the Greek .25-caliber rifle chased the Turk out of Macedonia, and then the Bulgarian into his hole, it would seem that the reduction of bullet wound is not particularly comforting from the standpoint of the recipients.

We have already used a .23-caliber rifle in our service, the navy using the .23 caliber Lee straight pull for several years prior to the standardizing of the cartridge of navy and army small arms.

The caliber of the American army rifle has not been changed since 1893, 23 years ago, and the time is ripe for another drop to a still smaller bore.

Business Men and Defense.[1]

BUSINESS MEN WANT PREPAREDNESS.

PUBLIC opinion is frequently difficult to analyze. But when three hundred and fifty-nine commercial organizations in forty-three States vote by one hundred and twenty to one for a scheme of preparedness to make the entire military, industrial and financial strength of the nation fully available, there need be no further pessimism as to the general soundness of American citizenship.

Business men have cast an overwhelming vote for universal military training. They are equally decided about a bigger and adequate army and navy. They believe in a Council of National Defense and a means to mobilize the unequaled industrial resources of the country. American business men are a conservative element of public opinion. Their judgment is based on a definite stake in the country and careful weighing of the cost of ways and means. A vigorous expression from them, by a sweeping vote for the most complete and thoroughgoing plan for preparedness which has yet been proposed either in or out of Congress, is momentous.

ANALYSIS OF THE VOTE.

	For	*Against*
1. For general preparedness	970	8
2. For a Council of National Defense	912	46
3. For a Staff of Industrial Mobilization	925	47
4. For an adequate navy	952	10
5. For a General Staff of the Navy	946	19
6. For a regular army with trained reserves such as recommended by the General Staff or Council of National Defense when established	946	21
7. For universal military training	889	56
8. For prearrangement with private companies for war supplies	940	26
9. For reserve supplies of war material	935	29
10. For additional commissioned and non-commissioned officers of the regular army and a properly trained officers' reserve corps	960	9

[1] *The Nations' Business*, June 19, 1916.

Hysterical movements can never have any permanent value. On that account, the referendum vote for National Defense holds a place of special significance. Since the outbreak of the war there has been propaganda for peace as well as for expectation of war. There has been a great wave of sentiment for greater military preparation in the United States. But there has been little if any opportunity for considered and measured reflection on the subject. The commercial organizations which voted on the referendum had forty-five days to consider and register their votes. Moreover, they had notice at the fourth Annual Meeting of the Chamber of Commerce of the United States last February that their vote would be called for in the near future.

Consequently they were prepared to vote on preparedness. The result is momentous. The Special Committee on whose report the referendum was based represented the army, the navy, the national guard and business. Its recommendations have gone further on thoughtful and permanent lines than anything yet proposed by any serious body. Every one of these recommendations, including the keystone of the arch, universal military training, has received an overwhelming endorsement, varying from 120 to 1 to a minimum of 15 to 1. The business men of the United States are a conservative element of the public opinion with a definite stake in the country and with full realization that they will have to pay a large share of the bills for national defense. They have not only endorsed a plan which provides for universal military training, with an army based on recommendations of the General Staff and a navy second in the Atlantic with surplus sufficient to be first in the Pacific, but they have appreciated the fact that this war, and any future wars, will be decided on the industrial strength and resources of the contending nations. They have consequently voted solidly for mobilizing in peace time the industrial and all economic resources of the country on a democratic basis which will make individual manufacturers and business men and the Government share equally in responsibility for the safety of the nation. The plan eliminates a profit interest in war.

It was natural that business men should emphasize the economic side of preparedness, for on that phase of it they are qualified to speak with some authority. But they have gone

further and included in their recommendations a complete system of national defense which will insure the colossal potential resources of the United States being made available for the supply and support of the army and the navy. They have realized that for every man on the firing line or at sea there must be several others effectively organized for support and supply on land. They have realized that in a democracy the only solution of aggregate responsibility must be found in equal obligations on the part of all citizens. We do not have voluntary taxes; why should we have voluntary defense?

Another thing which has resulted in a certain amount of lost motion in our departmental system of government has been the lack of coordination. Business men have seized on this point and offered a definite remedy. For policy planning and general advice and counsel, they have decided on the necessity and urgency of a Council of National Defense, or some body of that nature, which will be able to coordinate and plan continuing policies for the army and navy and render service to the President and Congress. To coordinate the material support for the army and navy, a staff of industrial mobilization is recommended which will do the same thing in munitions and equipment which the Council of National Defense will do in policy and counsel. Supplies and equipment and munitions for the army and navy can only be adequate if they are standardized and have brought to their support the entire economic resources of the country. The plans advocated by the Chamber of Commerce of the United States will call on every available plant in the country to learn the manufacture of at least one item in the long and diversified list of army and navy supplies. Those plants which can be utilized, either in the production of munitions or other supplies, must know in advance what part they will be called upon to play in fulfilling the needs of a crisis. It is now appreciated that in case of any serious war practically every manufacturing plant in the country would be required to produce, in greater or less quantity, supplies needed by the military establishment. But no adequate organization for such a crisis can be effected in time of emergency. Every step looking toward an efficient organization of this kind must be taken in advance. No "last hour" legislation can do it, nor hysterical, nervous effort. No manufacturing plant can be expected, with-

out months of costly delay, to swing from its regular commercial line on to the production of materials in the making of which no experience has previously been had, and for the production of which no plans have been made in advance.

The first move in this direction is an industrial survey. This is already being undertaken by a sub-committee of the Naval Consulting Board, of which Mr. Howard E. Coffin is chairman—a movement which has the expressed approval of the President of the United States and the Secretaries of War and of the Navy. In principle it has also received sweeping endorsement in the referendum on national defense. When the survey is complete—and it should be made official and permanent—then the Government is recommended to encourage manufacturers to make military and naval supplies. Not only munitions workers, but any plant whose equipment is found by the survey to be capable of adaptation to any form of supply, should be trained by small annual orders, based on prearranged price agreements, to be able to undertake larger orders in case of a crisis.

For example: Plant "A," having reported its equipment and facilities to the Staff of Industrial Mobilization, is inspected by an officer of the Staff and told that it can make fuses for shrapnel shells better than anything else which the government might need in time of war. Plant "A" then enters into contract with the government, agreeing to make from drawings and instructions furnished by the Staff a complete set of tools, dies, jigs, etc., necessary to turn its entire productive capacity to the making of shrapnel fuses. The government agrees to give a minimum annual order for fuses to Plant "A" in peace time sufficient to educate the working force of the plant and its managers in the production of fuses, together with profit enough to repay the investment in tools. The same contract further specifies the lease price at which the plant could be taken over with its personnel by the government in time of war. The government also issues an insurance policy to the owners of the plant that the physical property would be returned after the war in as good condition as it was before, less ordinary depreciation.

The lease price should be large enough to constitute a "living wage" to stockholders, *but not large enough to create a profit interest in war.*

The experimental, educational, inspection and assembly of

functions necessary for any complete system of quantity production should be carried on in district United States arsenals located in or convenient to the great industrial centers.

The principles of this system of munitions production will not only permit the peace time production of munitions at a less cost than under the present system, but will provide an industrial organization that can be at once expanded in time of war to at least one hundred times the peace requirements and at a moderate cost.

In this way not only would the current needs of the army and navy be met by drawing on such a wide range of industry as to prevent any combined profit interest in war supplies, but the immense potential resources of the country would be tapped and fitted, without economic loss, to the maximum demands of a great crisis.

In the opinion of the committee which framed the report which formed the basis of the referendum, such a system is sound insurance against war and aggression. To be peaceful is an ideal democracy. But to be potentially strong for the defense of its ideals should be a cornerstone of policy.

With these fundamental principles in mind, the symmetrical plan advocated by the business men of the country can be appreciated as a whole. *It is founded on the broad base of universal rights entailing universal obligations.* Such a plan will entail service in the industrial as well as the military establishment and insure every man, rich or poor, rendering service in the particular field where his training will make him most effective. Some will probably shoulder rifles, others will operate machines, despatch trains, manage communications and finance. All will be familiar with the problem of national defense. Every right to be worth anything must rest on an obligation fulfilled. *On this basis of universal obligation for training and defense is imposed an army adequate for the needs determined by our experts, the General Staff of the Army—or Council of National Defense* when established—and a navy which will keep our shores inviolate. To support these two lines of defense it is proposed to organize the entire economic resources of the greatest industrial nation of modern times. Banking, telephone and telegraph, transportation and industry must be viewed as national entity for support in a crisis.

Varied Ground.

The Auto Infantry.

The battle of the Marne is still designated by military critics as the crucial action of the European war. It meant the halting and hurried retreat of the right wing of the German army. It destroyed a number of military reputations, strategically saved Paris, and even when the war ends it may prove the principal factor in the decision of the great war, despite the larger battles and more desperate killings which will go to make up the complete chronicle of the giant struggle.

The sudden stoppage of General von Kluck's victorious army at the gates of Paris is credited to the unexpected appearance of the garrison of Paris, carried to the front on motor trucks and automobiles, every one of which within the city and its environs was impressed into service to move the troops to the critical point of contact, a few miles northwest of the outer fortifications of Paris.

Rapidity of action has won most of the batons of the world's successful marshals. It was the chief quality of Napoleon Bonaparte, and it is true of nearly all of the later successful generals in the field, down to the Confederate general, Forrest, untrained to war, but who grasped the art of war, in his own expressive words, by getting to the scene of battle "fustest and with the mostest men."

Within the present week* an important experiment was made by the Thirtieth United States Infantry, Col. Edwin A. Root, now stationed at Fort Sam Houston. This regiment, one thousand strong, fully accoutred for marching, camping or instant fighting, loaded itself into twenty-eight auto trucks in less than one minute, was carried through the crowded streets of San Antonio, out into the country a distance of nearly twelve miles, in one hour. At signal of the leading battalion commander, Maj. Harry H. Bandholtz, four companies cleared out of the cars in less than forty seconds and spread out in open order over a piece of broken country. The two remaining battalions, under Majors Ferguson and Threlkeld, followed in close formation, and the modern fighting scene for a regimental unit was com-

*May, 1916.

plete. The recall of the troops was equally prompt, and the infantry command returned to camp, after a lapse of little more than two hours, having covered approximately twenty-four miles, the equivalent of a big day's march by either cavalry or infantry.

Even those students of war who know only by theory of the heroic and ugly business can easily grasp the significance of this quick movement of foot soldiers. The column, it is estimated, could have covered twelve miles an hour, for an indefinite run, without effort. They were moving at a much more rapid pace than cavalry could for even a dash, if the distance exceeded a few miles. The troops arrived at the scene of possible action in perfect physical condition, without the fatigue and strain of a day of heavy marching. They were ready for a fight in the fittest possible way.

The regiment which made this test, by direction of General Funston, and with motor trucks arranged for by the Department Quartermaster, Colonel Rogers, was the demonstrating command at Plattsburg, last year, at the first of the big citizens' training camps. On that occasion, the regiment made a practice march of 200 miles to demonstrate the endurance of a regular command of the United States army. The regiment, therefore, had probably no superior in the service anywhere, for marching or fighting. If this same regiment of the "incomparable infantry," and all the other like infantry regiments can, to use the expressive words of Forrest, "get there fustest," it means a very much quicker campaign for the American army if it is to be thrust suddenly into a war on the border, provided also that the motor car equipment is provided. The incident certainly spells a great change in the massing of the foot soldiers on future battlefields.—*The San Antonio Light.*

"Between Sunrise and Sundown."

A mute argument for preparedness hangs on the wall of the Grand Central Palace, where the Sanitation Exposition is being held in New York. It is a placard taken from the side of a building in Liége, Belgium. Translated, it reads:

To the inhabitants of Liége:

The population of Audenne, after having testified to their

pacific intentions in regard to our troops, attacked them in the most treacherous fashion. With my authorization, the general commanding the troops has laid the town in ashes and has caused 110 persons to be shot. I bring these facts to the knowledge of the town of Liége in order that its inhabitants may know the fate they may expect if they take a similar attitude.

GEN. VON BUELOW.

Liége, August 22, 1914.

This is what happened when "freedmen" tried to "spring to arms" between sunrise and sundown.—*The Camp News,* Plattsburg, June 10.

Combination Shelter Tent-Bedding Roll for Officers

General Orders No. 85, War Department, 1914, states:

Equipment "A" is the equipment prescribed for use in campaign, in simulated campaign, or on the march. It is limited to the animals and vehicles prescribed in the Tables of Organization, the equipment and clothing worn on the person, and the articles carried on mount, and transported in field, combat, and divisional trains.

The following extracts are taken from the Tables of Organization, War Department, 1914, which were prepared by the General staff of the Army, and approved and published for the information and government of the Regular Army and Organized Militia of the United States:

EXTRACTS.

It is fully realized that in this re-arrangement and curtailment of transportation, certain inconveniences will be met. It is believed, however, that careful consideration will make it apparent that when troops are operating in large bodies, the factors of road space, mobility, and general fighting efficiency must take precedence over all considerations of convenience and comfort.

* * * * *

The transportation allowances for baggage of all branches and arms are based on requirements for campaign when troops are serving as integral parts of a division and under all conditions except those of extreme winter. For a winter campaign, when climatic conditions make it necessary to have additional clothing,

tentage, stoves, equipment, etc., additional vehicles must be temporarily attached to the baggage section of the field train.

* * * * *

At the annual tactical inspection and at such other times as may be ordered by commanders, the baggage and ration allowance and the distribution of loads in the field train will conform in every way to the requirements of Section I of these tables; in other words, to the amount and kind of transportation that would obtain in actual war.

* * * * *

The baggage allowances given on Page 10 are in no way intended to restrict the amounts of tentage, baggage, cooking outfits, etc., that may be required in permanent and semi-permanent camps, either in time of peace or in time of war. The allowances for permanent and semi-permanent camps are prescribed in the various equipment manuals. The baggage allowances given on page 10 fix definitely the amounts that are to be carried in the baggage section during peace, except as hereinbefore provided, for commands smaller than a brigade in marches not having field training for their object.

* * * * *

Section I, Table 3C, page 10, Baggage.

3.—Regiment, artillery, infantry, cavalry.

(*a*) Each field officer: one small pyramidal tent; officers' bedding and clothing roll: 50 pounds.

(b) Each captain, lieutenant, and veterinarian: one shelter tent complete; officers' bedding and clothing roll: 50 pounds.

II.

The above extracts show clearly that the old-style bedding roll, about 30 inches in diameter and weighing from 100 to 175 pounds, supplemented by a trunk locker, will no longer be tolerated in a well disciplined command, under conditions where equipment "A" is prescribed. To comply with orders, it therefore becomes a serious proposition for an officer to decide upon just what he can put in his bedding roll to get the greatest amount of convenience and comfort. Cases have already occurred where the commander on a march, after inspecting officers' baggage in some remote camp, has issued orders for immediate compliance with the "Tables of Organization." This necessitated either the abandonment of the excess on the ground or a wild scramble to some nearby farm house to deposit it and request that it be sent at some convenient time by express to the officers'

station. It also causes much inconvenience to the officers for the remainder of the march.

III.

The following described combination shelter tent-bedding roll with contents and weights is submitted with the hope that it may assist officers going into the field with equipment "A" to determine upon just what they can take in their rolls and be perfectly comfortable without exceeding the authorized allowances:

Tables of Organization authorize (3C, page 10):

Officer's bedding and clothing roll ..... 50 pounds
1 shelter tent, complete (2 shelter halves, 2 poles, 10 pins, 2 ropes) ..... 8 pounds

Combining all of the above in one roll gives an allowance of 58 pounds. The accompanying photographs show the absolute practicability of this equipment. The roll when ready for transportation is neat, compact, and easily handled. The tent has been tested both in rain and heat in the tropics and found to give entire satisfaction. There is no doubt it will do the same in colder climates. The following articles can be included:

	Lbs.	Ozs.
1 combination shelter tent-bedding roll with clothing pockets	8	8
14 pins, shelter-tent, aluminum or wood		12
2 poles, wood, brass jointed	1	12
1 rope, for tent and bedding roll		15
1 cover, canvas, for outside of roll and floor of tent	3	
1 mattress, silk floss, 6′ 4″ x 2′ 6″	8	
1 pillow, special, 14″ x 18″	1	8
2 blankets, light-weight wool or 1 service blanket	6	8
1 mosquito bar with snap hooks (shape of tent)	1	4
1 basin, canvas		8
1 bucket, canvas		8
1 lantern, folding, Army pattern for candles	1	8
12 candles, lantern	1	
Clothing.		
1 breeches, o. d. woolen or khaki	1	12
1 shirt, o. d. flannel		15
1 shoes, marching, with rubber heels	2	8
1 shoes, gymnasium, Army standard	1	1
3 suits underwear	1	8

COMBINATION IN USE AS TENT.

	Lbs.	Ozs.
5 stockings, pairs, light wool		10
4 handkerchiefs		3
1 housewife		4
1 laces, shoe, extra pair	—	—
1 rubber heels, extra pair with nails		6
1 pack carrier		8
1 poncho or rain cape	2	6

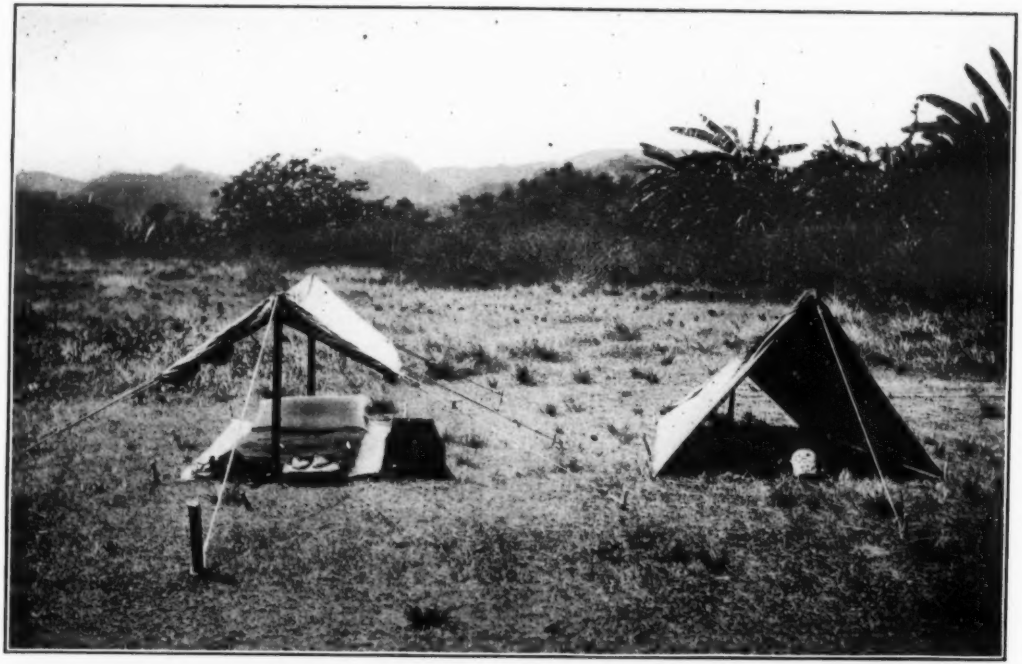
Toilet articles and other necessaries.

1 brush, hair		3
1 brush, finger-nail		1
1 brush, tooth, in metal case		2
1 comb, hair		1
1 mirror		11
1 powder, talcum, can		4
1 powder, tooth, can		4
1 powder, foot, can		4
1 soap, cake, in aluminum box		3
1 paper, toilet, package		13
2 towels, bath	1	12
2 towels, face		8
1 shaving outfit, consisting of:		
1 safety razor, 6 oz.; 1 shaving brush, 2 oz.; 1 soap, holder, top, 3 oz.; 1 bottle listerine, small, 6 oz.; 1 blade sharpener, 2 oz.; 1 strop for sharpener, 1 oz. Total	1	4
6 solid alcohol, cans, with can holder	2	2
1 adhesive plaster, can, 1 yard, 1″ wide	—	—
Tobacco, cigarette papers, matches, stationery, stamps, etc.	1	
Total	57	—

The following additional articles will be carried when ordered and additional transportation allowed therefor:

1 headnet, mosquito (G. O. No. 85, W. D., 1914; G. O. No. 39, W. D., 1915)		14
1 sweater (when not worn) (G. O. No. 8, W. D., 1915)	2	

For cold weather and when extra bedding and other articles are ordered, additional transportation will be attached for the purpose.



BEDDING ROLL TENT AND SERVICE SHELTER TENT.

IV.

SPECIAL FEATURES AND ADVANTAGES.

The double-end feature makes it possible to close the entire tent completely as a protection against rain or cold weather; when used as a bedding roll, the ends fold in over the mattress without inconvenience or bulging.

The side walls can be rolled up and let down at will as well as the triangular end flaps and to suit the convenience of the occupant. There is sufficient room in the tent, so that the occupant does not come in contact with the side walls of the tent and cause it to leak in wet weather as is the case with shelter tents without side walls.

Waterproof pockets for clothing and all necessary toilet articles are attached to the triangular flaps at one end of the tent.

A rectangular piece of heavy canvas forms the floor when the tent is pitched, and when the equipment is rolled up, this piece of canvas is used as an outer covering for the roll to protect the tent from being torn or rubbed by a wheel. The rope used to anchor the tent is also used to lash up the bedding roll when rolled for transportation.

The mosquito bar is built in the same shape as the tent. Baby snap-hooks are sewed to the bar along the top and sides, and these are attached to small rings placed in corresponding positions on the inside of the tent. The mosquito bar is therefore stretched to the dimensions of the tent when in use, and it may be quickly and easily removed when not required.

The weight of the mattress would seem to indicate that it is a sleeping pad; as a matter of fact, it is a perfectly comfortable mattress made from silk floss.

The compactness and neatness of the roll make it easy to transport on either wagon or pack animal. The roll is susceptible of expansion to accommodate any additional articles which may be ordered or authorized. The cost of assembling the equipment is very moderate. This combination is adapted to supply the greatest amount of comfort and convenience possible and at the same time conform strictly with orders and regulations.

F. W. COLEMAN,
Capt., 3d Infantry.

Pitching Army Tentage.

Paragraph 799, Infantry Drill Regulations, as amended July 8, 1915, and paragraph 260, Sanitary Troops Drill Manual, outline a single method for pitching all army tentage except the conical wall and shelter tents. This makes the method applicable to pyramidal, small pyramidal, wall, small wall, hospital, ward, and storage tents.

In this drill, a detailed description of each movement in pitching tentage is purposely omitted for brevity and in order to give general instructions only.

When pitching tentage in exhibitions or athletic contests, it becomes necessary for each company commander to elaborate this drill and add a detailed description of every movement in order to secure uniformity of action, equal distribution of work, and also in order to gain speed.

The following amplification, the use of which is permitted by the War Department, supplies these details and makes the method a clear-cut tent drill of military precision. As the distance between corner wall pins and corner guy pins is, by this amplification, measured by a guy pin which is exactly two feet long, the tent is always pitched with mathematical accuracy. This amplification is readily learned as the next movement to be performed is always the logical one. It also arouses great interest when given as an exhibition drill or when used in a tent pitching contest. Its details are as follows (as the phrase rectangular tentage describes all army tentage except the conical wall and shelter tents, this term is used in a description of the drill):

INSTRUCTIONS FOR PITCHING, STRIKING, AND FOLDING ALL RECTANGULAR TENTAGE.

1. Rectangular tents have four sides. The front is side 1. The sides are numbered in the direction the hands of a watch travel, side 2 being the right side of the tent, side 3 rear side, and side 4 the left side.

2. Four or eight men and a noncommissioned officer pitch all rectangular army tents. The four men are numbered 1, 2, 3, 4; or with eight men, squads 1, 2, 3, 4, each squad being two men. Each man or squad works on the side of the tent cor-

responding to his number, and drives or removes all pins and tightens or loosens all ropes on that side.

TO PITCH TENT.

a. Count fours or squads. At the command "pitch tents," No. 1 drives the right front corner wall pin while the others place tripod and upright (or ridge, etc.) on area and unroll tent. (For wall, hospital, ward, and storage tents, the uprights are inserted with bases at side 4; for pyramidal tents at side No. 1 with tripod in center.)

b. No. 1 places right front corner wall loop over the driven pin and ties door. (No. 3 ties rear door, if any.)

c. No. 4 pulls bottom of front wall taut and drives left front corner wall pin through corner loop, aligning it on front pins of other tents, if any.

d. No. 2 draws side 2 taut and drives right rear corner pin through corner wall loop, making a right angle to front line.

e. No. 3 pulls left rear corner taut and drives wall pin through corner wall loop. The tent is now on the ground pinned at its four corners.

f. No. 1 at the right front corner drives corner guy pin No. 1, at a proper distance, in a diagonal line of tent. No.'s 2, 3, and 4 do the same at their corners. (Distance of corner guy pin from corner wall pin: wall tent, small, and small pyramidal, 6 feet; pyramidal, 7 feet; wall, hospital, and storage tents, 8 feet; ward, 11 feet. Measure with a guy pin, 2 feet long.) Fasten guy ropes to these pins.

g. Each number now drives a wall pin through each remaining wall loop on his side. (For ward, hospital, wall, or storage tents, each wall pin on sides 1, 3 and 4 is driven at site of wall loop instead of through it, for convenience in placing and raising uprights. Also the corner wall loops of these tents at corner wall pins 3 and 4 are now removed from the corner pins for the same reason. After tent is raised, these loops are placed over the pins.)

h. Each number now drives a guy pin at every point on his side where a guy rope, fully slackened, crosses an imaginary line extending from corner guy pin to corner guy pin, and attaches the proper guy rope to it.

i. Adjust hood (or fly and storm guys, if any).

j. Raise tent. (If it is desired to raise the tent quickly, raise just after the four corner guy pins are driven and guy ropes placed over them. The remaining pins can be driven later. If, however, the tent is a ward or storage tent, drive guy pins opposite each interior upright for extra support before raising by this method.) Each number now goes to his side and tightens or loosens corner guys first, and then the others as directed by the noncommissioned officer, who thereby aligns upright (or uprights).

k. Hood guys, if any, are now fastened.

TO STRIKE RECTANGULAR TENTAGE.

Remove contents of tent. While the general is being sounded, loosen all guy ropes on side 1 and 4 only. Do not remove any guy ropes, loosen them only. (For tents of the ward or hospital type, remove all wall loops from pins on sides 1, 3 and 4 also.) At the last note of the general, remove upright (or uprights). Where there is more than one upright, remove them through side 4. If one upright only remove through the door on side 1. For pyramidal tents, remove all pins except the two rear-corner wall pins, and for wall, ward, hospital or storage tents, the corner wall pins on side 2.

TO FOLD RECTANGULAR TENTAGE.

Pyramidal tents as per paragraph 2, Bulletin No. 9, W. D. 1913. *Tents of ward or wall type:* Pull apex beyond side 2, until smoothly on the ground. Smooth out end triangles and fold them so that a rectangle is formed. Fold in two-foot folds from apex until tent is in a long slender rectangle about two feet wide. Now fold from each end as with the pyramidal tent. This method of folding places the wall on the outside and thereby gives protection to the roof. If there is a fly, fold it in a long slender rectangle similar to the tent, place tent on it, and fold tent and fly together. For the ward tent, roll from one end only and tie with four guys instead of two. This gives a drum-shaped package easily handled.

William W. Reno,
Major, Medical Corps.

The "Service Cap."

With the coming reorganization of the Army, attention might well be directed to one article of clothing that has little reason for existence—the "service cap" for enlisted men.

The first service uniforms were modeled on the blue dress, with cap, blouse, and trousers in khaki. When the woolen service was added, an additional woolen cap appeared, before which the cotton service cap finally disappeared. Meanwhile the service hat—a purely American article—has been improved in appearance and decreased in weight. Useless in storm, distressing under a hot sun, forbidden in the field or on the range, the woolen service cap should follow its cotton predecessor into the records of the past.

The number of articles in the equipment of the soldier should be reduced to the smallest possible. It is believed that the dress uniform is proper and essential. The service uniform is also well designed and essential. The service cap is a misfit between the dress and the service outfits, neither one nor the other.

In garrison throughout the service, the service cap may be replaced by the hat whenever the soldier wears a waterproof coat, overcoat, slicker, poncho, or on other occasions when authorized by the post commander on account of severe climatic conditions or when the wearing of caps would endanger the health of his command. The hat is also worn in the field on target practice, and on fatigue.

The service cap is specified for wear while changing station by rail. A command ordered into the field from its station wears the campaign hat. In the first case, the hats must be shipped with the company baggage. This is peculiarly an article that will not endure crushing. If a soldier attempts to pack his hat in his locker or barrack bag, at the end of the movement reblocking is necessary. Many organization commanders provide boxes in which the service hats are placed for shipment, thus adding greatly to the bulk and materially to the weight of the organization baggage.

When a move is made by rail under conditions requiring that hats be worn, the care of the caps presents a greater problem. The cap is injured by crushing more than the hat, and is not easily reblocked. As a result, many soldiers simply throw away

their service caps with the intention of drawing new ones when required—an unnecessary expense sometimes repeated several times during an enlistment. The boxing of service caps demands greater addition to the weight and bulk of the company baggage than the same treatment of hats, as the former will not nest.

The mobile forces of the U. S. Army have been living under service conditions along the border for the past several years where there has been little or no use for this cap. At times, when camp conditions approached a permanency suggesting garrison life, the men were required to draw "service" caps—only to store them or throw them away when the move finally came—an unnecessary expense and charge against the clothing allowance of the soldier.

All recruits are issued this cap for use at recruit depots and required to wear it until joining their organizations. If the ultimate destination be in the Philippines, Hawaii, or the Canal Zone, the cap is then permanently replaced by the service hat, and the soldier has a useless souvenir of his recruit-depot days.

When properly cared for and with the cord sewed all around close to the brim as prescribed, the service hat is neat in appearance besides being light and comfortable to wear. The shape may be restored when necessary by reblocking or merely pressing the brim with a hot iron. There is no more excuse for the service hat to be untidy in appearance than the service coat or breeches.

The service hat is distinctively American and is probably the best military headgear in existence for varied service conditions. The cap—from an European model—is a dress affair and belongs to the dress uniform. The "service" cap has no good reason for existence and should be dropped as an article of uniform. This leaves the service hat for the two service uniforms—woolen and cotton—and the dress cap for the dress uniform, an ample sufficiency of headgear.

R. H. Kelley,
1st Lieut., 4th Infantry.

Recommendations for Promotions, French Army[1]

The Minister of War on May 16, 1916, sent the following circular to all commanding officers:

At this time, when the question of promotions is to be again taken up, I beg you to call the attention of all grades of the military heirarchy that recommendations which have been forwarded to me since the beginning of hostilities have not always been based upon the sentiments which the present conditions should inspire.

For example, too often members of the supply departments are recommended for promotion on account of their length of service. Also the officers to whom my attention is called as being endowed with qualities which clearly place them above the others of their grade are, however, arranged in order of preference for promotion after candidates noted as less distinguished but senior.

In addition certain officers to whom great praise is given are set aside as "too young" although they may have served, in certain cases for some time, the legal minimum of period requisite for promotion.

Accordingly, it may be considered that certain senior officers consider promotion as a "recompense" reserved to seniority.

These methods of procedure must be most rigidly proscribed.

The regulations of May 2, 1914, state in the most formal manner that for promotion by selection "previous services must not be considered except within the limits within which they give means for judging aptitude of the candidates for the higher grade." Especially in time of war, vacant posts should not be filled for any other reason than strict consideration of the services to be rendered. The past can be considered only as a means of forming an opinion and as a pledge for the future.

The strict and absolute duty of all heads and directors of the services of war as well as of commanding officers is to designate for the choice of the Minister of War the most capable candidates, those who by the combination of intellectual and moral qualities with technical efficiency are best fitted to serve

[1]Translated from *La France Militaire*, Paris, May 20, 1916, by Major J. R. M. Taylor, U. S. Army.

efficiently in the higher grade. If they are younger than others less qualified, the service can but gain by it.

In any case, it is utterly inadmissible in time of war that a promotion by selection can be made simply as a reward for past services. The military grades, like all public employments, are created and maintained for the good of the state, and they should not be employed to guarantee to old servants of the State, however deserving, a more honorable end to their career.

If in time of peace it is very wrong for a commander to make his recommendations on the ground of seniority alone to avoid making the decisions necessary for deciding according to merit, or to try in vain to avoid wounding someone, in time of war such feebleness it utterly unpardonable, and I shall not permit it.

Whoever yields to it has his share in the faults and errors which a less feeble choice would have avoided and renders himself responsible for the useless sacrifice and damages to which he exposes the country.

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Editorial Department.

A higher training and greater individual ability are essential today for Infantry than for any other arm. It is more difficult and it takes a longer time to train Infantry to any standard of efficiency today than to bring any other arm to a corresponding standard.

The Conservation of a Principle.

In a letter to the Chairman of the Senate Committee on Military Affairs, transmitting an analysis of the Army Reorganization Act of June 3, 1916, the Secretary of War stated: "After deducting the necessary troops for the oversea garrisons, the troops remaining in the United States are just sufficient to organize the divisions mentioned, and this gives what is termed a well-balanced military organization because there is just enough of each arm to make a good fighting machine, and there are no extra organizations left over. *This is the first time in our history that the army has been organized on such a basis, although nearly all other armies of the world are so organized.*"

The judgment above expressed on the merits of the Army Reorganization Act cannot fail to receive the acquiescence of all fair-minded men. A basis has at last been established upon which an organized army, complete in all its parts and capable of independent employment, can be built up—provided we are all content to await the consummation and build gradually and securely.

Unfortunately, the provision of the law authorizing the immediate organization of so much of the entire increase provided as may at any time be deemed necessary, leaves a loop-hole which if not guarded against may destroy or mangle the whole principle of a balanced organization which it is the object of the Act to establish. The danger to be apprehended from this source is increased by the fear which apparently exists in some quarters that subsequent Congressional action may prevent the organization of all the increments contemplated by the law. It is possible that this may act as a stimulus to an attempt by some particular

arm of the service to secure its entire increase in anticipation of such Congressional action. Such an attempt is to be deprecated because of the fact that no one branch of the service can be thus favored without detriment to the rest of the service and to army organization.

Until recruits are available, the formation of additional regiments can only result in an increased promotion which the enlisted strength of the Army will not justify. The Army cannot afford to advocate any scheme whose sole result will be an inflation in the rank and number of its commissioned personnel. Such a course would inevitably lead to a disastrous reaction on our future development.

The War Department has welcomed the principle of a well-balanced and properly proportioned army in the justly deserved terms of praise which we have above quoted. Consistency as well as military necessity demands that no project for piece-meal increases be entertained and that the principle which has been praised and accepted be defended and carried to a successful conclusion.

It is this principle for which the Infantry has contended for years and for which it was finally successful in securing recognition as the keynote of the Army Reorganization Act. In the future as in the past, we shall abide by this principle and shall oppose any attempts that may be made to destroy it.

The Mobilization of the National Guard.

The recent call of the Organized Militia into the service of the Federal government differs from all previous calls through the fact that tactical organizations were called for instead of numerical quotas. This method will not, of course, give us higher units capable of immediate employment; it has nevertheless certain distinct points of superiority over a numerical summons that may not be appreciated from a casual consideration of the wording of the call.

The first of the advantages that becomes apparent is that a call thus framed indicates the intention of the execution of a detailed plan which would otherwise require long and careful study and many conferences between the different agencies concerned to reach an agreement; it may indeed be doubted whether any well-

digested plan for the higher organizations of new units could be formed had the drafting of the organizational scheme been deferred until the occurrence of the emergency. Without a preconceived plan, it seems certain that the whole scheme of organization would be evolved on the basis of the interests of ambitious candidates for military rank, and would, from the viewpoint of tactical necessities, be entirely haphazard in its nature.

The plan of organization in accordance with which the mobilization now in process is being conducted was formulated as the result of conferences between the General Staff, the Division of Militia Affairs, and State authorities in 1912. The plan contemplated the formation of twelve tactical divisions corresponding to twelve groups of contiguous States. These divisions were incomplete at the time of the adoption of the plan, and most of them are still considerably short of completion. The organizational scheme was adopted as a guide for the formation of new units, and each State was thus given notice of the units it would be expected to raise to complete its quota. Many of the States took steps toward the raising the units assigned to them which were not already in existence, so that the actual composition of the National Guard today approaches the tactical necessities of army organization much more closely than it did before the scheme was published.

In regard to the raising of the units still required to complete the tactical organization, the advantage of the existence of a well defined scheme is apparent. There is now no question as to what new units are required nor as to the States which are to raise them. With definite knowledge of the units required, each State can proceed with their organization on the basis of information which has been in its possession for four years and in view of which definite plans should have been drafted. Reports indicate that many States are now making efforts to complete their quotas, and if given time and opportunity, they will doubtless meet the requirements of the divisional plan.

Not the least of the advantages of the organizational scheme lies in the power which it gives to limit the appointments of the numerous candidates for the positions of general officers, which never fail the Nation in an emergency. With exact knowledge as to the higher units to be formed, general officers can be selected

to command definite tactical units instead of the units being raised to create positions for particular persons. It almost goes without saying that this feature of the question is almost sure to subject the plan to attacks and possible disruption in the interest of persons to whose ambitions it may constitute an obstacle.

The divisional scheme is the concrete expression of the spirit of teamwork. As such it represents the general interest as opposed to the interest of individuals and should receive the active support of all who are interested in the general welfare. Its value as the expression of a definite policy has already become apparent, for it has made possible continuous and progressive action, while without it, there could have been only halting, vacillation, and conflict.

The second step in the plan of organization after the divisional quotas have been completed and raised to war strength, and field army troops have been organized, will be the formation of the depot battalions authorized for the National Guard by the National Defense Act of June 3, 1916. Here another danger, illustrated by our Civil War history, is to be guarded against. Our history shows that as soon as an organization of this nature has been formed, pressure is brought to bear to get it to the front, regardless of its fitness for service and the deficiency in strength of units already in service. The likelihood of such action will be increased if the provisions of the new law authorizing the consolidation of depot battalions into provisional regiments are given effect.

In its common acceptation in this country, the term mobilization signifies the assembling of units at concentration centers and is assumed to be complete when the personnel has completed its concentration. This is, however, a very imperfect view of the operation. Mobilization in its full sense is, of course, the process by which organizations are made mobile, *i.e.*, capable of immediately participating in active operations. The assembling of a group of men, be they soldiers, boy scouts, or school teachers, in a few days or hours is a comparatively easy task, but an army is not mobilized until it is capable of taking the field with fair chances of success. The degree of time and care which this state of efficiency implies depends very largely upon the character

of the adversary. It is unfortunate that immediate demands of the situation made it impossible to retain the National Guard at the mobilization camps until it could be fully fitted to carry through to a finish any task which the future may impose upon it. From a purely military standpoint, it seems certain that such a course would in the long run result in an actual saving of time so far as the final object is concerned.

Doubtless the movement of the National Guard to the border will result in a temporary disruption of the divisional organizations. It is to be hoped, however, that the military situation will permit an early regrouping of the National Guard units in accordance with higher tactical organization.

¶

Matériel for Field Service.

As compared with foreign military establishments, the American Army has perhaps been characterized by ultra-conservatism in regard to the adoption of new types of matériel. Although the rolling kitchen has long since demonstrated its value under practically all conditions of service and on all characters of terrain, we have only within the past year taken steps looking to its adoption. As yet there does not appear to have been developed in this country a type of rolling kitchen which fulfills all desiderata. This is especially the case in respect to the fireless feature, which is a characteristic of the rolling kitchens of European armies. The necessity for the fireless feature in any really successful type of rolling kitchen is apparent: food which has been brought to the boiling point in the early hours of the morning can continue cooking during the march and be ready for use at the noon halt or at the end of the march. Without this feature, cooking with firing will have to be relied on exclusively, and this cannot well go on when the kitchen is in movement. The cooking must therefore be completed before the march commences or after it is finished. In the first case, the food will not be hot when required for use, and in the second, the meal must be prepared after the halt is made. In either case, the principal advantages of the rolling kitchen are lost.

The equipment of all European armies includes an outfit for squad cooking, the different components of the outfit being dis-

tributed among the members of the squad. We rely upon individual cooking with the mess kit for the preparation of such meals as are not prepared by the company cooks. While this system may be practicable for small commands which dispose of unlimited ground and an abundant supply of fuel, it is questionable whether it is suitable for large commands upon whose space in bivouac large demands will be made and for which fuel will be difficult to secure. In our own Civil War, the squad system of cooking with equipment largely extemporized seems to have been the rule, and doubtless the equipment can be extemporized for any future operations. But a carefully designed equipment will serve the purpose much better than extemporization, and the subject is of sufficient importance to merit careful study and consideration. On a terrain like that of Northern Mexico, with a sparse supply of timber, the question of fuel supply is one that should be taken into consideration in this connection as well as in respect to the fireless feature of the rolling kitchen.

In a country which is only scantily supplied with railroads, the motor truck becomes a factor of prime importance. This is more especially the case if the terrain of the theatre of operations, like that of northern Mexico, affords no supply of hay or grain for foraging the animals required for the draft of wagons. Dependence upon animal-drawn transportation will destroy the mobility of columns or reduce the number of troops that can be employed, not many days' march after leaving the railroad base. If the line of communication is greatly lengthened, the animals will finally be scarcely able to haul more than their own forage requirements. The daily requirement of a 4-mule team in grain and hay is about 92 pounds and its hauling capacity about 2,700 pounds under favorable conditions; a march of 30 days—fifteen forward and fifteen in return to the base—would therefore completely destroy the power of teams to deliver supplies, and shorter distances would reduce this power proportionately. When it is considered that the animals of an infantry division number nearly 6,000 and that our forces will probably comprise 14 infantry divisions, the enormous daily requirements in forage become apparent. The daily forage ration for this command alone, in which cavalry divisions and field army troops are not

included, will be approximately 1,900,000 pounds, which will require somewhat more than 700 wagons for its transportation. This amount will increase in an increasing ratio with the number of days' march between the command and its base.

It is said that trucks cannot yet replace animal-drawn vehicles now used in the field and combat trains as they rapidly tear up unimproved roads and make deep cuts which are deepened by wind or water. The solution of this difficulty so far as the line of communications is concerned would seem to be an adequately organized force for the repair and upkeep of the roads. In any event, it is evident that the utmost must be done to introduce the truck for transportation proposes wherever possible. The trucks employed in punitive expedition in Mexico are reported to have done wonderful work in spite of lack of proper organization, equipment, and disciplined drivers, and these deficiencies are being rapidly overcome. These trucks were hastily collected to meet the emergency of the expedition, and necessarily had some defects that would be eliminated in trains more deliberately organized and equipped.

The difficulties of supply, already serious enough in the infantry division, will be enormously increased in the case of cavalry division. The latter comprises more than 12,000 animals for both riding and draft purposes, and its daily requirements in the way of forage will be 276,000 pounds. One day's forage for a cavalry division will therefore require more than 100 wagons. When to this is added other special requirements in the supply of mounted organizations, such as horse shoes, veterinary supplies, horse equipment, etc., it can easily be seen that the difficulties of supply may become so great as almost to immobilize these units. Somewhat parallel conditions are found in the Manchurian campaign, where the conditions of supply resulted in almost entirely eliminating the factor of mobility from the operations of both armies. Much criticism has been made of the inactivity of the Cossacks in this campaign, but while this may have been in part deserved, their failure was chiefly due to the difficulties of supply which attended any movement at a considerable distance from the railroad. One has only to consider the enormous difficulties of supply under which Nogi's envelopment of the

Russian right flank at Mukden, relatively slight in scope though it was, took place, to realize why the factor of mobility was conspicuously absent from the Manchurian campaign.

Motor transportation has come into prominence in the present European war as the most powerful agent of mobility at the disposal of a military commander. Without greatly increasing the demands on supply columns, auto transportation enormously increases the mobility of fighting troops. By making possible the rapid transportation of a large force of infantry to a critical point of the line, the automobiles of Paris were the means of saving the Battle of the Marne to the French. Automobiles made it possible for the English to run down the mounted force of De Wet and capture its leader. And, finally, at a critical stage in the early days of the Battle of Verdun now in progress, the remarkable performance which they rendered in transporting 100,000 men in a period of about three days stemmed the tide of a French defeat which was about to set in. In Russia, the realization of the value of motor transportation for the rapid movement of infantry has resulted in a special organization of the motor service for this purpose. An American firm is now said to be delivering to that country a truck designed to carry 50 soldiers. For the transportation of troops, a car of this design possesses a marked advantage over the ordinary supply truck which has a maximum capacity of only about twenty-five men.

It seems to be a foregone conclusion that hand grenades will play no part in an American campaign for the reason that these missiles find application only in trench warfare. It is well, however, not to form too dogmatic conclusions on this subject, for grenades have been used in mobile operations, both in the Manchurian campaign and the present European war. Grenades will probably find employment whenever an assault of an intrenched position becomes necessary. As yet we do not appear to have developed any standard type of grenade, and our troops have certainly had no experience in their use. Grenades can, of course, if necessary, be improvised, but design is always superior to improvisation.

Great changes have transpired since the Spanish-American war, and these are sure to alter many of the aspects of opera-

tions in our next campaign. Just what the nature of some of these changes will be cannot of course be precisely predicted, but many of them are foreshadowed by the nature of the terrain of the probable theatre of operations and the experiences of contemporary warfare.

Φ

The Plattsburg Camp.

Prior to the year 1916, Plattsburg had no especial claim to fame or notoriety but occupied a modest position as one of the less generally known though highly respectable cities of the State of New York. Within a year, its name has found its way into the common vocabulary of American citizens as a symbol for the whole summer training camp idea, much in the same way that the other geographic term, Chautauqua, sprang from comparative obscurity into a general national conception. Summer camps for the military training of citizens are now often spoken of as "Plattsburg Camps" and the idea that gave inception to them is generally spoken of as the "Plattsburg idea."

As generally understood, the "Plattsburg idea" is based on the principle of unconditional national service. This was at all events the construction placed upon it in the sharp alignment on this issue which took place in the preparedness discussions of the past year. But the transition from "national" to "universal" is logical and almost inevitable, and the advanced position on the military question which the representative men of the training-camp movement have taken makes it fairly certain that in the future the Plattsburg idea will become synonymous with universal military service.

A few years ago when the summer-camp idea was first put into operation, but little importance was attached to the encampments, which were generally regarded merely as a pleasant form of summer vacation for college students. Some few pacifists of the type of K. G. Karsten, who addressed the well-known pacifist circular to college students about a year ago, became alarmed at what they regarded as an attempt to foster the militaristic spirit, but no one perhaps conceived of it as the forerunner of important developments. But important movements often have their origin

in small beginnings, and when the outbreak of the European war threw out in relief our own military shortcomings, many of the men who had participated in the Plattsburg camps and there gained some insight into the nature of military training became prominent advocates of a better national defense and exercised considerable influence in the formation of public and press opinion.

While carrying away no illusions as to the extent to which he is prepared to render efficient service against a fully trained opponent, the Plattsburg trainee gains some appreciation of the more simple and fundamental characteristics that distinguish the soldier from the civilian. He learns to understand something of the real nature of military discipline—the discipline through which a soldier learns to look upon his actions not as they may affect himself personally, but rather in the light of their effect upon the military force of which he forms a part. The fact that it is occasionally necessary to enforce the observance of this principle by punitive methods has unfortunately too often brought into prominence a feature of discipline that is entirely incidental and secondary and has led to the misconception of discipline as a means of the crushing out of the soldier's individuality instead of developing to the highest degree his individual initiative in the furtherance of the tasks assigned him.

In the practical application of this idea, the program of instruction is drawn with a view of constantly bringing to the trainee's attention the ways in which he can contribute to the success of his organization. This process commences with the formal drill of the soldier. Here the idea is enforced on the trainee's attention that everything he does affects the action of every other member of his company. For instance, in the marching of troops in line, one man out of dress will throw out the line of the whole company; one man who executes a movement in the manual of arms in a ragged fashion will mar the appearance of the whole company. These results are not, of course, in themselves of importance. The training in precise drill is, however, one of the most powerful means at the disposal of a military commander for inculcating the idea of coordination and of teaching the individual man to took to his commander as the means of affecting that coordination.

The precise drill is, however, the most elementary phase of the program. The same idea that underlies precise drill is applied in more active ways to situations which are similar to those which will arise in actual campaign. As a member of a patrol or outpost detachment, the soldier is confronted with a situation under which he must act on his own initiative; or as a member of a unit in combat, he must learn to pick up the target which pertains to him and carry out the fire orders of his unit commander. In all of these situations, discipline is the force that ensures united collective action instead of the individual dispersion of untrained troops.

The Plattsburg camp has reopened this year with even more than its accustomed energy, and with a larger attendance than at any previous encampment. *The Camp News,* an innovation of the present encampment, estimates that on October 5, close to 20,000 citizens will have been put "through the mill." The program of instruction consists of a basic course in infantry instruction, supplemented by elective instruction relating to infantry, cavalry, field artillery, engineer corps, signal corps and medical corps; men who have attended a previous training camp are permitted to take the elective instruction exclusively.

The "Plattsburg camps," either in their present form or in a more highly developed state, promise to be a military feature of abiding permanence. For until universal military service is adopted, there will always be a special place in our military system for the volunteer who desires to receive military instruction but can devote to it only the period of a month's summer vacation. In appraising the value of such training, it should not be forgotten that periods of continuous instruction under a military régime are more productive of results than intermittent drills of short duration.

Φ

The Duties of the Hour.

We are passing through an epoch that may be characterized without exaggeration as the most remarkable military age in modern times; in the scope of operations and innovations, even the Napoleonic age is almost dwarfed into insignificance. Military events have crowded on one another so thick and fast that

the effect would be bewildering had we not become so sated with sensational events that only the most striking occurrence creates a sensible impression.

Two years ago this month, the European war burst forth on an astonished world and rapidly grew to colossal proportions. Developments followed in the realm of military science which had not previously been even remotely suspected and of which we have yet but a vague idea. The European War had in this country a reflex action in an awakened public interest in the military condition of this country. This interest has been accentuated by disturbances on our southern boundary, in themselves of slight importance from the viewpoint of military operations but fraught with great possibilities. All this has led to a degree of attention to the conditions of our military establishment on the part of the American people which they have never before devoted to it. They have of course found its size entirely inadequate; but there is also considerable evidence of an inclination to criticize its efficiency. This is not by any means confined to the antimilitaristic elements but includes many well-wishers of the cause of preparedness, who, not comprehending that the army like every other governmental institution of the country is a product of the political institutions under which we live, have been disposed to blame the Army at large for deficiencies due to the difficulties of a unified control at the fountain-head.

It is none the less urgent that the Army at large put forth its best efforts in order that no just ground for such criticisms may exist and that it may be equal to the tremendous task which recent legislation has imposed upon it. No such task has fallen to us during the career of any officer now in active service, and it is imperative that we all—and especially the infantry—accomplish the expected results in the various duties that will soon devolve upon us.

It will not be practicable to obtain the aid of the War Department in the solution of the various problems that will arise, and the individual on the spot will have to do as best he can, aided by his own judgment, initiative and energy. Never before have so many opportunities for enlargement and advancement presented themselves to the army. With existing commissioned strength of 5000 officers, the army is charged with developing the latent

military strength of a nation which is essentially non-military in character. To it will fall the duty of developing the National Guard, the training camps, college and school cadet battalions, the Reserve Corps, and all the other unformed methods of bringing out the national military strength. Individuals must make the most of opportunities. Those detailed with the National Guard must control and regulate its development into a military force and not permit it to deteriorate, as some fear it may, into a political machine for the creation of a political standing army. Until we succeed in localizing regiments, recruiting is likely to prove a difficult problem; but the difficulties must be overcome, and the recruiting officers of the new regiments must get the recruits.

We must develop a service sentiment for the adoption of definite policies for settlement of questions of personnel. We are accustomed to speak of the "pork barrel" with some scorn; let us not forget that the "pork barrel" within the service is no more holy than the same receptacle anywhere else. It is perhaps even worse, for those who avail themselves of it do so with the conscious knowledge that they are contributing to the inefficiency of the service. The pages of the current Congressional Record are redolent with evidence of attempts of special interests or individuals to gain unfair advantages or special preferment. There can be no question of service efficiency so long as these conditions prevail and so long as decisions on matters of personnel are not based on lines of definite policy. Unrest and mutual suspicion are inevitable results of a shifting treatment of personnel questions.

We can no longer live the old army life, isolated from the country at large and threading our own secluded pathway. We must become part and parcel of the national life if we are to fulfil our mission. The country will expect us to yield returns on the facilities which it has placed at our disposal, and we can do no less than meet its expectations.

Policy and Politics.

Few words in our language are so closely allied in origin and form and yet so opposite in their influence as policy and politics. Politics—at all events, in the common acceptation of the term—

stands for the exploitation of personal interest to the detriment of national welfare, policy the ordering of individual interests in accordance with national necessities. Hence the two are constantly in opposition, politics ever seeking to prevent the adoption of policies or to undermine and destroy those in existence.

It is, to be sure, a blind policy which ignores individual interest or refuses to consider it except as an evil. It is the virtue of a wise policy to make the interest of individuals coincidental with those of the State and exploit it to the national advantage.

A carefully formulated policy in regard to the appointment of regular officers to higher rank in the National Guard is one of the questions pressing for settlement at the present time. It is essential that a basis be established for the adjustment of this question that will subordinate the interests of individuals to the higher interests of army organization and military efficiency. In the absence of a policy, the individual is entirely justified in availing himself of all legitimate means for his own advancement. But it is precisely the function of a policy to set limits to the action of individuals and direct their efforts to the promotion of the general interest.

It has often been said that it is useless for the War Department to attempt to regulate the appointment of officers in the various classes of civilian soldiery that may be raised—that political "pull" will always dictate these appointments. But this is only a half truth. The reason why political influence has dominated the situation in the past is largely to be sought for in the fact that no definite policy has ever been developed and political pressure was therefore the only influence at work. Naturally if no policy is adopted, it is impossible to allege any tenable reason why an appointment should not be made when any demand for it arises. An individual scramble thus results which is not pleasant to contemplate and over which one would gladly draw the veil of decency; but it is as inevitable as the race to reach and stake out a claim when public lands are opened or the rush to reach the theatre door at the cry of "fire."

The control of the question by the War Department does not, it is true, necessarily imply that ideal results will follow. Unless a definite policy is adopted, personal influence within the War Department will control developments as was largely the

case during the Spanish-American War. An adjustment of the question on personal lines by influences within the War Department will be no more satisfactory than any other sort of personal influence. Whatever system is adopted, we cannot hope to attain the ideal, but it can nevertheless be approached with some degree of proximity.

Logical reasoning would seem to lead to restriction of commissions to the branch of the service in which the vacancy occurs. There is ample room for the employment of all available officers in their own arm of the service, and efficiency is best conserved by placing the officer in the position which his training best fits him to fill. Moreover, the principle of the single list appears to have been rejected, and some regard should be had for the jewel of consistency. If the single list were in operation, there would be good ground for disregarding the lines of arms of the service, for we should then have in all branches officers familiar with the duties of other arms.

We have no apprehension that were appointments made on the basis of efficiency records, the infantry arm would not share at least proportionately in all appointments. The record of infantry officers as a whole as shown by the standing of graduates of the Army Service Schools for the past ten years is sufficient guarantee for assurance in this regard. But we do not believe in passing on to Peter the coat cut for Paul.

There must be a well defined field for the activities of officers of all arms of the service. No arm can prosper as long as its natural field is thrown open to officers of other arms, while it is itself denied access to any other field but its own.

It is only too plain that the avenue by which politics enter into army administration is the personal interest of elements or individuals within the army itself. In their eagerness for expansion or increase of power, the different elements have allowed themselves to be played off one against the other, and thus the whole is reduced to a state of impotence. This is stupid and unnecessary. The personal factor is not an evil; it can be dealt with along the lines of broad-minded policy and exploited to the increased efficiency of the service.

Book Reviews.

Instruction on the Lewis Automatic Machine Gun. By Simplex. London: Forster, Groom & Co., Ltd., 1916. Cloth-board, 3½ x 5¼ inches, illustrated. Price 2s.

This book has been written on account of the increasing use of the Lewis Machine Gun in the British service, there being now nearly 20,000 of this type in use. It was written by the well known former Hythe instructor, Sergeant Bostock—now Lieutenant Bostock—after his return from the front severely wounded, and embodies not only the theory of the employment of machine guns but also the results of the practical use of this weapon under conditions where it has become one of the most deadly of all the instruments of destruction devised by man for the "pacification" of his fellow man.

The first part of the book is devoted to a technical description of the Lewis gun and its mechanical operations.

The second part of the book relates to the training of machine-gun sections in the tactical handling of the weapon. On this subject the author says that the more important phases only can be touched upon within the limits of an instruction manual and that a large size book could be written on "The Use of Machine Guns in Trench Warfare" alone.

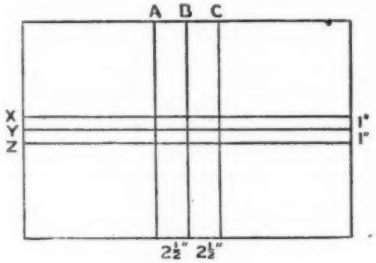
Lieutenant Bostock starts off by saying, "It has been found in the present war that a machine gun gives confidence to the men around it," owing to its inherent characteristics, particularly in a crisis, such as a sudden attack. Some of these characteristics are set forth under such headings as close grouping of fire "particularly with the Lewis gun"; laying and clamping for indirect fire and night firing (where the gun is laid in daylight); accurate fire in large volume; small space occupied; quickness of traverse; invulnerability, a most important characteristic, because "if casualties occur, another member of the section can take the injured man's place"; and finally, mobility: "The gun is easily moved from place to place and can follow infantry closely in an attack."

The chapters devoted to methods of fire are most instructive. For instance, ranging fire is said never to be necessary in trench

warfare and is used in open warfare only when absolutely necessary, because it destroys the valuable element of surprise and moreover indicates the position of the gun, which may at once become the target for artillery or grenades. The method for using cones of fire is described at length and the statement made that "75 per cent of shots fired will fall in a certain area called the effective beaten zone (E. B. Z.)." Bracketing fire follows field artillery practice as do overhead and indirect fire. An interesting means for vertical searching in night firing is described where, for instance, a machine gun is set to guard a bridge and its approaches although neither can be seen, and the gun may be relaid after firing—

The gun is laid as required by daylight, and a box, inside of which a candle or electric light can be placed, and which has one side lined to allow light to come out, is placed 10 yards in front of gun, and in line with gun and target. (A wooden box with parchment side will satisfy conditions in case of emergency.)

The gun having been correctly laid, the sights are put up, *but the elevation not altered,* until sights are on the intersection of the center lines, B and Y.



A, B, and C are parallel, and 2½ in. apart.

X, Y, and Z are also parallel, and 1 in. apart.

Vertical searching may be done by altering aim between X and Z, while Y is always the checking line for elevation.

Traversing may be done between A and C, B being direction checking line.

2½ in. at 10 yards = a traverse each side of 10 ft. at 500 yards. This is ample.

The chapters on the use of the machine gun in trench warfare are the result of actual experience in the present conflict where the guns are frequently placed at intervals as close as one for every 16 men on the front. Special emplacements for machine guns are arranged, but the guns are never fired from them except in the event of an attack. The favorite method is to take the gun to some other point from which it is fired in bursts of a few rounds, and then quickly removed to another place. The reason for this is that a burst of fire from a machine gun is a direct invitation to a reciprocal call from grenades or trench mortars in view of the nearness of the opposing trenches.

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Scouting and Patrolling. By Captain Wm. A. Waldron, 29th Infantry. Washington: U. S. Infantry Association, 1916. Cloth, 122 pages, 3½ x 4¾ inches, illustrated. Price 25 cents.

Heretofore our available information on the subject of scouting and patrolling has been limited at best to one chapter or one or two problems in various text books on tactics. For the first time, all this information is collected in one handy publication, which, however, is much more than a compilation, for the author has included much valuable information on his subjects never heretofore published. This is one subject on which an officer or noncommissioned cannot have too much information, practical if possible, but if not, then the next best thing, book knowledge; for from the nature of the service, he is thrown entirely on his own initiative with no friendly hand to help him out in dangerous places. On his judgment also depends to a great extent the correctness with which his commanding officer will estimate the situation.

Today ninety per cent of our recruits come from the cities. They lack those primitive virtues which our ancestors possessed. Without instruction, they cannot find their way through a strange country nor read the plain language of the trail. They do not know how to use their eyes, how to conceal themselves, they cannot differentiate sounds, and they are entirely at sea in the dark. In all these things, Captain Waldron's little book will start them on the right road in their practical work. In these

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days when the lessons of war tend to teach us to think more in terms of divisions and of mass than of individual combat, we should have some handy little book from which the individual soldier can learn what to do when he is thrown on his own initiative in the presence of the enemy. We also need something which covers the individual work required of noncommissioned officers and privates when on the service of security and information. These needs seem to be very completely filled by the work under review. This book is unreservedly recommended to the company commanders of the mobile army, who will greatly increase the efficiency of their individual work by providing every man in their companies with a copy.

War Pictures Behind the Lines. By Ian Malcolm, M.P. New York: E. P. Dutton & Co., 1915. Cloth, demy 8vo, 226 pages, illustrated. Price $2.

It is refreshing these days to find an author who is willing to leave the question of the origin and conduct of the war to other pens and who modestly refrains from describing life and death in trenches, which, as Mr. Malcolm states, he has never visited. This concession is so much greater than many other writers have been willing to make that the reader can not but appreciate it. The main purpose of the book is to record features of the Red Cross work in which the writer was engaged and to sketch scenes visited and people met in the course of many trips between the lines.

The author had been a Member of Parliament and was beyond the age limit for recruits and untrained in military work, so on the outbreak of war he looked around for some way in which he could be of service. His opportunity came with Lord Kitchener's first call for 100,000 men, and he organized a traveling recruiting bureau—

> Our recruiting methods were no less unusual. . . . The plan was for our fleet of cars to leave our headquarters about 10.30 each morning and to drive in procession with flags and placards through a certain section of the area allotted to us. In this way, great interest was created in the agricultural districts, both in the war itself and in the matter of recruiting. At each village we used to stop . . . and often pick up a recruit or two, occasionally a dozen, before the evening. . . . I am afraid, on looking back to those interesting but comparatively calm weeks, our irregular methods must have been a great trial to the more highly organized but not very elastic system of the regular army—as represented at the depots.

After about two months of this service, the author joined the Red Cross Society, and the interesting part of his work began. There is much for us to learn from his narrative, particularly in the organization of the new department of missing and wounded, and later of the identification of graves of English soldiers wherever possible and the erection of more permanent marks to replace the rapidly disintegrating records left in the first hurried days. An important branch of the work was the attempt to catalogue the casualties in such a way as to give prompt information to the anxious ones at home. The con-

fusion incident to placing and properly recording the comparatively few men who were brought from Montauk Point to New York hospitals in our Spanish War shows how necessary such an organization is. The French system is better worked out—

Whenever a patient is admitted, there is an Army regulation that the principal medical officer shall send a post card within twenty-four hours to his next-of-kin, stating the nature of his wound and how he is progressing; more than that, a further post card is despatched every seventh day after his admission, so that the family's anxiety is reduced to a minimum. Obedience to this order is strictly enjoined, and involves practically no further correspondence with distressed relatives at home.

A chapter is devoted to the training and usefulness of the sanitary-service dogs, which have been found so valuable in this war—an interesting commentary in view of the difficulties found by our Treasury officials in the way of subsisting the generous gift of one of our own officers for the establishment of the nucleus of such a service in this country.

A Study of the Development of Infantry Tactics. By Colonel Beca. Translated by Captain A. F. Custance, with preface by Colonel Hackett Paen, C.B. London: George Allen & Unwin, Ltd., 1915. Cloth, 12mo., 130 pages. Price 50 cents.

This volume, which is familiar to many of our readers through previous editions, contains a general review of the tactical evolution of the infantry arm, followed by a discussion of accepted modern theories thereon. The preface refers in an interesting way to bearings of social development, inventions, and practical training upon tactical innovations. The introduction contains brief but timely comment upon the education of the English gentleman and army officer in particular. The text proper first takes up the influences which have modified fighting conditions since the war of 1870, discusses the human factor and the value of morale, and gives brief explanations of the advantages and disadvantages of the Greek phalanx and the Roman legion, upon which all infantry tactics, even of today, are based. This is followed by a discussion of European tactical rules of the eighteenth and nineteenth centuries showing how the armies of every great nation at that time adopted and then discarded during the various stages first one and then the other of the funda-

mental principles of the ancients. The effect of modern artillery fire, shrapnel particularly, upon infantry is explained in detail with some essential figures on the subject, and formations both vulnerable and practicable are clearly presented. Different methods of advancing are discussed, and finally the logical and approved modern scheme of battle tactics is taken up, explained in considerable detail with reference to the means of advance, kind of fire, formation and successive movements of the column, and steps to be taken after culmination of attack. The reconnaissance for armies is touched upon as is also the modern manner of locating defense lines. The fundamental that infantry is the fighting arm is consistently evident throughout the book.

Training in Bayonet Fighting. By Captain Edgar T. Conley, 30th Infantry. Harrisburg: Wm. Stanley Ray, State Printer, 1916. Paper, 43 pages. U. S. Infantry Association, Agents.

"Only the offensive is decisive," and by offensive is meant an attack driven home, only possible to the soldier armed with, and knowing how to use *"l'arme blanche,"* the bayonet.

This is a particularly timely and instructive book. It is based upon the Revised English Manual of December, 1915, and embodies the lessons of sixteen months of the war. Bayonet training is treated in its details as well as with respect to its relations to other means of combat. Many new ideas are set forth, the logic of which is apparent, or becomes so on continuing the study of the text. The present war has introduced many refinements into methods of the battlefield, and those relating to bayonet fighting are incorporated in this brochure.

A feature of the detailed exercises is an enumeration of the faults likely to be committed.

Among the sub-titles are the following: The Bayonet Charge; The Short Thrust; The Upward Thrust; Hand to Hand Fighting; The Charge and the Assault; The Charge and Assault in Dense Lines; Tests, individual, company, battalion and regimental; Equipment, Rising from the Prone to charge or advance; Extracts from a recent Aldershot Lecture on Bayonet Fighting.

THE UNITED STATES INFANTRY ASSOCIATION

"The object of the Association shall be to promote the efficiency of the Infantry arm of the military service of our country by maintaining its best standards and traditions, by fostering esprit de corps, by the dissemination of professional knowledge, and by the exchange of ideas as to the utilization of such knowledge with particular reference to the rôle of infantry in modern war."—Article III of the Constitution.

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All commissioned officers in good standing, or former commissioned officers of honorable record of the regular or volunteer military or naval service and of the organized militia are eligible for regular or associate membership in the Association. Membership dates from the first day of January or July nearest the date of enrollment.

Dues are $1.00 annually, payable in advance. Payment of dues entitles a member to all the privileges of his class and to all ordinary publications of the Association except the INFANTRY JOURNAL, to which subscription is extra. Members, however, may obtain the JOURNAL for $2.00 the first year, and $1.00 yearly thereafter.

All communications should be addressed to the Secretary, United States Infantry Association, Room 506, Union Trust Building, Washington, D. C.

The Infantry Prize Essay, 1917.

FIRST PRIZE

One Hundred Dollars in Cash and Life Membership in the Infantry Association.

SECOND PRIZE

Fifty Dollars in Cash.

SUBJECT

The subject will be optional with the writer but must be one of vital interest to the Infantry arm of the service. The importance and timeliness of the subject will be one of the factors considered in making the award.

RULES

1. The competition shall be open to regular members of the U. S. Infantry Association. These according to the constitution are:

a. Officers of Infantry, active or retired, of the Regular Army, the Porto Rico Regiment, and the Philippine Scouts: officers of the Staff Corps appointed from the Infantry.

b. General officers of the Regular Army.

c. Former commissioned officers of Infantry, Regular or Volunteer.

2. The length of the essay is limited to 12,000 words. The manuscript must be typewritten, double-spaced, and in duplicate. When a member in submitting his essay states that it has been impracticable for him to comply with this requirement, a manuscript in longhand and in single copy will receive due consideration.

3. Manuscripts must be received in the office of the INFANTRY JOURNAL on or before March 1, 1917. The manuscripts must be signed with a *nom de plume,* and the name and address of the writer enclosed with the manuscript in a separate sealed envelope, the outside of the envelope bearing the same *nom de plume* as the manuscript.

4. Immediately after March 1, a committee will be appointed to decide upon the relative merits of the essays submitted. The author of the essay considered worthy of the first prize will be paid $100 in cash and enrolled as a life member in the Infantry Association; the author of the essay deemed worthy of the second prize will receive $50 in cash. Should none be deemed worthy of first or second prize, the committee may, in its discretion give the best one submitted "honorable mention."

5. All manuscripts submitted will become the property of the U. S. Infantry Association, which reserves the right to publish them in the INFANTRY JOURNAL, or dispose of them in any other manner it sees fit.

6. Members shall be debarred from competing after having won the first prize twice.

Bi-Monthly Journal.

Beginning with the issue for November, 1915, the INFANTRY JOURNAL was published as a monthly, though no change was made in the subscription price. This innovation was very cordially received and many commendatory letters came to the Editor, well repaying the extra effort necessary.

The present field service of the greater part of Infantry officers on the Mexican border is, however, unfavorable to the work of the military author, and this situation has resulted in a material decrease in the number of contributions submitted for publication. The increased duties devolving upon our officers in consequence of the National Defense Act is likely to have a similar effect. As present prospects indicate an indefinite continuation of these conditions, we find it impracticable to continue the publication of the INFANTRY JOURNAL as a monthly magazine. The issue of May, 1916, will complete Volume XII, and beginning with the present issue, publication as a bi-monthly magazine is resumed.

New Members--June Journal.

Reckord, M. A., Major, Maryland National Guard.
Donan, Arthur L., Captain, Kentucky National Guard.

Infantry Journal Advertiser

GENTLE HINTS, No. 24

WASHINGTON, D. C., July 1, 1916.

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